TEXTILE WORLD

KINK BOOK

VOLUME XI

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TEXTILE WORLD
KINK BOOK—VOL. XI

Compiled from the columns of
TEXTILE WORLD

by

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(Technical Editor, Textile World)

Bragdon, Lord & Nagle Company, Inc.
Publishers
New York, U. S. A.

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NEW YORK.

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FOREWORD

It is always a great pleasure to present a new Kink Book to our friends who read TEXTILE WORLD. So many of these friends co-operate during the year in supplying material for the Questions and Answers Department of TEXTILE WORLD that we really consider the publication of these annual Kink Books to be a mutual undertaking.

For the information of new readers we might explain that for many years it has been the practice of the publishers of TEXTILE WORLD to compile what they consider the best technical questions and answers submitted by mill men during the preceding year and to publish this in handy book form. If your travels take you among the mills, you will find thousands of superintendents and overseers who have considerable collections of these annual Kink Books. Any practical mill man who has such a collection of Kink Books possesses a technical library on practical mill work which can scarcely be excelled. There are few problems in mill operation, production and management which have not been covered by these questions and answers.

The demand for Kink Books has been so large that we have had to place a price of $1.00 per copy for those who are not subscribers to TEXTILE WORLD. Every subscriber to TEXTILE WORLD is entitled to his choice of one Kink Book free with each year's subscription. Subscribers who wish to acquire additional Kink Books may purchase them at the special price of 75 cents per copy.

We take this occasion to acknowledge our indebtedness to the many contributors to TEXTILE WORLD, including manufacturers, superintendents, overseers and experts in mechanical and chemical lines. We also extend a hearty welcome to all those engaged in the textile industry who may wish to use the facilities of our organization for getting information on any problem whatsoever.

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Shuttle Marks

I should appreciate it very much if you would explain to me the meaning of the term "shuttle marks" as applied to defects in cloth. Will you explain methods for preventing same. (6271)

Shuttle marks are the cause of much second-quality cloth. No matter how skillful the weaver may be, or how well the cloth has been woven, shuttle marks, not always perceptible to the naked eye during weaving, will make second-quality cloth. There is no condition that arises in the weave room that will give more aggravation to weaver, loom fixer, second-hand, or boss weaver. The overseer of the cloth room has his troubles also because the shuttle marks are not easy to see when the cloth is being inspected. But these marks, no matter how faint they may appear in the unfinished cloth, are very hard to remove during the finishing because they are not surface marks. They are woven into the cloth.

Shuttle marks are caused, in most cases, by the shuttle pressing the filling against the front part of the shuttle box just as the shuttle is leaving the box. Sometimes they are made by the filling rolling under the shuttle as it leaves the shuttle box.

The moisture in the weave room will cause the shuttle to sweat and gather dirt. The moisture will also cause the shuttle box to sweat and gather dirt. Just as long as the filling is kept under proper control, and the shuttle is properly guided in its passage from the shuttle box, the filling will not be marked; but the slightest contact between the shuttle and the front side of the shuttle box, with the filling in a position to be pressed between the box and the shuttle, will mark the filling for a distance of one-quarter

to one and one-half inches. The result is what is termed a dirty thread woven into the cloth.

Many fixers tie a piece of cloth around the front of the shuttle box. This will stop the shuttle from making marks for a short time only. After a time the cloth gets dirty and the marks will reappear.

The loom with the binder in front of the shuttle box is the worst offender, because the position of the binder is such that as the shuttle is being driven from the box, the binder is forcing the inner part of the shuttle towards the back of the shuttle box and the outer part of the shuttle will incline towards the front of the box. This can be overcome by adjusting the mechanism at the rocker foot so that the push of the picker, from beginning to end, will be toward the front of the box. As the rear end of the shuttle is always in contact wtih the picker, during its passage from the box, this will have a tendency to force the front end of the shuttle toward the reed.

It is an easy matter to fix a drop box loom in the manner described because the picker stick drives the picker and the picker is guided by a spindle and not by the picker stick, as on the single box loom. This spindle can be adjusted so as to drive the front end of the shuttle toward the reed, thus lessening if not entirely eliminating any possibility of the shuttle pressing the filling against the front side of the shuttle box.

The only way to prevent shuttle marks is to fix the loom as described above. If the shuttle marks are made by the filling rolling under the shuttle as it leaves the box, it is because the filling is out of control. This condition usually occurs on a loom where the cloth that is being woven is narrow and the loom is wide. Filling that is marked because of rolling under the shuttle will make marks much longer than when marked by contact between the shuttle and the shuttle box.

Silk and Cotton Stockings Dyed Unevenly

We are enclosing herewith a stocking made of mercerized cotton and silk. It was dyed with neutral dyes of both wool and cotton classes. You will note that at the suture the dyestuff failed to go on the silk. We should like to have your opinion as to the reason for this. (5957)

If you examine these stockings as they come from the knitting machines we think you will find that the cotton sole tends to roll up, curling so that the poorly dyed silk comes inside a cotton roll. Then when the stockings are put in the dye bath, this roll of cotton enclosing a narrow band of silk in the junction of the sole and instep, makes a bunch which the dyestuff does not penetrate as readily as the rest of the stocking, and consequently does not dye the same shade. It seems to us that it is entirely a matter of getting the proper penetration. The cotton sole rolls up in such a way as to prevent the silk within it from being dyed as the normal leg fabric. The only remedy we can suggest is to attempt to avoid the curling of the sole in the dye bath.

Rayon Breaks Down in Slashing

I am enclosing sample of colored rayon that is giving trouble in slashing. The ends break down between the squeeze roll and the cylinders. We use regular rayon size. The rayon is "B" quality, dyed with vat colors. It has been on spools in storage for about two years. Please advise the cause of the weakening of the fibers. (6095)

The sample of rayon shows a very good material with a soft feel, high luster, and good strength. We do not think the trouble is due to the treatment or the materials used in the dyeing. The sample indicates that the time it has been on spools in storage has not weakened the strength any.

It appears to us to be strictly a slashing problem, though it may go back as far as the warping. If the rayon is warped on a beam and a hard, stiff paper is used, the sharp edges of the paper may damage the ends.

Different makes of rayon require different tensions, and this has to be worked out in each mill on individual machines. The tension should be so regulated that there is just enough pull to carry the yarn along. We would suggest that the inquirer examine the size roll. Sometimes the solder at the seam has worn away, leaving a raw edge which may cut the rayon. The squeeze roll may be too heavy. The gears on the size roll or side shaft may be slipping.

There may be too much cloth on the front roll, causing excessive tension. Or perhaps there is too much weight on the beam behind the size box, the rayon being stretched too much at this point. The cylinder may be pulling too hard. A little heavier size may also help. However, we think that the main trouble will be found to be with the tension between the squeeze roll and the front drag roll. The cylinder should be gear-driven to take the tension from the rayon.

Manufacture of Oval Rugs

If you can furnish us with any informaton as to the type of loom employed in the manufacture of oval-shaped rugs, and also the method used in their manufacture, we would be exceedingly grateful to you. We are fairly well acquainted with the methods used in the manufacture of rectangular rugs, but we see the possibilities of developing a trade in the oval-shaped rugs, and consequently this information is desired. (6038)

In general it may be said that no special type of loom is employed to manufacture oval rugs, but various regular types of looms are used for this purpose. Of recent years there has been quite a vogue for oval rugs. This fashion was originally set by certain of the Wilton manufacturers. For their particular process the oval rugs are woven on their regular types of looms, and the jacquard cards are cut so as to bring up the ends to form an oval design. Naturally the balance of the cloth woven is merely in the nature of backing and is made up of the cotton warp and filling, with the wool or worsted working as dead in the back. The woven product is cut from the loom just the same as any other strip of carpet would be cut. The surplus backing is cut off in the finishing room and the edges of the rug are bound and in some cases finished with a long or short fringe, according to the taste of the manufacturer.

As far as velvet oval rugs are concerned, these are printed in the manner usual to the printing of all velvet rugs, excepting that the design is confined to oval or circular shapes. The surplus material is cut off and the binding and fringing is carried out in the same manner as in the case of the Wilton rugs.

In the case of chenille oval rugs, the same type of loom is employed to weave chenille ovals as would be used for the weaving of rectangular pieces, the only difference being that the chenille fur is set in the loom in an oval or circular shape, rather than being set to cover the entire surface of the carpet. In a general way, it may be said that the manufacture of oval rugs lies more in the finishing than in the weaving.

Are Pick Counters Popular with the Weavers?

Can you tell me what the attitude of weavers is towards paying by the number of picks as shown by counters? Do they generally prefer this to the old method of paying by the cut? (5980)

We do not recall any instances of opposition on the part of weavers to paying by the pick after they have tried it. They usually concede that it is the fairest way and leaves nothing to argument as to the amount of cloth woven. Where two or more shifts are employed, it is the only satisfactory way to avoid disputes. A few days ago, in speaking to a manufacturer, he mentioned that they have had two or three minor strikes due to other causes, where part of the weavers walked out. The weavers that were left were allowed to select the looms which they wished to operate, and invariably they chose the looms which had counters on.

Selvage Cut on Pillow Tubing

I am enclosing a sample of pillow tubing on which you will notice the selvage is cut on one side. Will you kindly advise me if possible where this is done. I claim it is done in the bleachery, while others claim it is done on the looms. (6167)

The cutting of the selvage on one side is done in the calendering operation. It is apparent that this pillow tubing is very well finished with a high gloss, and it is necessary to calender under fairly good pressure in order to obtain this finish. It should be said, however, that the construction of the selvage seems to be faulty on the side where the damage has occurred. It is difficult to be positive on this point where we have only the material in the

finished condition. Some of the selvage threads on the damaged side seem to have floats that create a distinct ridge.

The owner of the goods should bear in mind that the fabric has been starched in order to get the necessary finish, and before calendering they are naturally very sharp and rough to the touch. Squeezing them on the calender has broken the filling threads and the tension lengthwise has shown up an apparent weaving fault in a more pronounced condition. It is not always possible for a bleacher to detect faults in the gray goods without considerable expense and trouble.

The undamaged selvage is an example of how a pillow tubing selvage should be made. By comparing this in the gray goods with the selvage that is damaged the inquirer can determine whether any change in the selvage construction should be made.

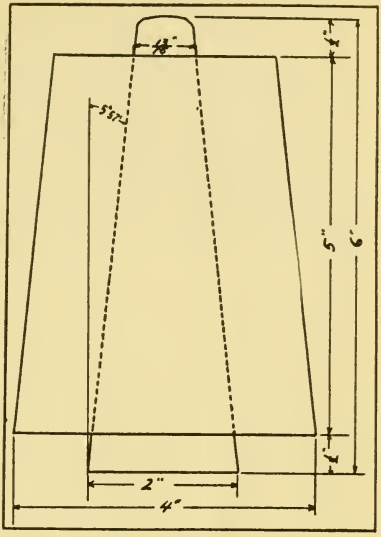
In calendering goods with a ridge formed by the yarns the finisher is facing the same problem as in attempting to calender a leno effect with a cord down the middle of a leno stripe. The cord very readily cuts the filling thread. This is what seems to have happened in the finishing of this tubing. Judgment should be based on the gray goods as well as on the finished goods.

Calculating Speed of Yarn on Winders

Kindly explain how to calculate the maximum and the minimum thread speeds in yards per minute on a No. 50 Universal cone winder of the following description; taper, 5°57′; throw of traverse, 5 in., ½ in. from each end; diameter at base of empty cone, 2 in.; altitude, 6 in.; r.p.m. of spindle, 1200; diameter at base of full cone (½ in. from base of cone), 4 in. The spindle makes 2½ revolutions to one throw of the traverse. Does this affect the calculatons any? (6313)

The simplest way to calculate these speeds from the data given, without the aid of trigonometry, is to draw a diagram to scale. A protractor is of course needed to lay out the angle of taper. The whole purpose of the diagram is to find the diameter of the cone at the upper extremity of the yarn package. The calculations would have been much simpler if you had measured the circumference of the

empty cone at this point. The writer found this dimension by means of his diagram, reproduced herewith, to be 13/16 in. At this point on the empty cone the yarn is given its minimum speed when winding on a diameter of 4 in. at the base of the completed package. The problem simply resolves itself into finding the surface speeds at these two points.



Cone of Yarn

The decimal equivalent of 13/16 is .8125. The circumference of a circle having a diameter of .8125 in. is .8125 x 3.14, or 2.55 in. Since the cone has a speed of 1200 r.p.m., the surface speed at this ponit in inches per minute will be 2.55 x 1200, and this divided by 36 (the number of inches in one yard) will give 85 yds. per minute as the minimum speed of the yarn.

At the larger diameter the calculations will be the same. The circumference will be 3.14 x 4, or 12.56 in.; and the speed will be (12.56 x 1200) ÷ 36, or 418 yds. per minute.

The average speed for the cone will be (85 + 418) ÷ 2 = 251 yds. per minute, which closely approximates the figure given in the catalog of the Universal Winding Co.

The fact that the spindle makes 2½ revolutions to one throw of the traverse does not affect the calculations except to show that the speed varies constantly from one moment to the next, even in one traverse. The minimum and maximum speeds calculated here are therefore instantaneous.

Preventing Slugs in Cotton Yarn

I am sending you a sample of leather from my roller; also sample of yarn I am making which contains slugs. The rolls are good and are finished with a good gloss, but the trouble is that waste comes over the roll and gets into the yarn, making slugs in the yarn. This makes it hard for the spinners, also spoolers, I would like advice to stop the waste from coming down through the yarn. I have on my clearer board the regular clearer cloth. I have been running those rolls for two weeks and they are still the same as the first day they were on. (6044)

We cannot see any fault with the roller leather. Judging by the sample of yarn sent, the trouble is undoubtedly caused by spinners not keeping their clearer boards picked. The yarn shows that the waste or slugs is clearer waste, and is loose on the thread. If you will require your spinners to pick systematically their clearer boards, say three times each day, this trouble will disappear. The drawing frames, slubbers, intermediates, and speeders will also need the same attention.

Epsom Salt in Soaking Silk

Will you kindly let me know if it is all right to use epsom salt in soaking raw silk. (6041)

The use of epsom salt in soaking raw silk is not common practice, and in the writer's opinion it would be detrimental rather than helpful. A solution of epsom salt (magnesium sulphate) would have a tendency to make an insoluble compound with the sericin or silk gum.

The soaking of silk has for its primary objects the softening, smoothing, and lubricating of the silk thread. Magnesium compounds, in the writer's opinion, will not do this. If used in conjunction with soaps, the soaps are thrown into the thread in an insoluble state, which promotes stickiness and rancidity.

The following reply was received from a chemist: Epsom salt used in the soaking of silk to add weight will cause the silk to become brittle. The soaking of raw silk is a big study. More silk is spoiled by improper soaking than by any other operation in a throwing or weaving plant.

Kinks in Worsted Yarn When Frame is Stopped

I would greatly appreciate any advice you could give me to overcome the kinking up of yarn when a spinning frame is stopped overnight. When the cap spinning frame is stopped on the upgoing motion of the lifter, the yarn slips from the bobbin and produces a rather large kink which does not disappear when you start up the frame next morning, but stays in the yarn, is twisted in in the twisting, and causes weak spots in the warping, since practically only one end of the two-ply has to carry the strain of pull. Do you know of any device which would start up the spindles a fraction of a second earlier than the front roller, thus enabling the bobbins to take up the slack before the front roller delivers any more yarn? (5991)

In ring and cap spinning, a uniform spindle or bobbin speed is necessary to maintain uniform winding conditions. The size of traveler or distance of cap edge from fly board is modified to give the correct winding tension. If the speed of spindle or tubes is reduced, winding tension changes. Below a certain speed there would be no winding, and yarn would accumulate between front roll and bobbin, thus causing snarls or kinks.

Whenever a ring frame or cap frame is started or stopped, we have a gradual change from low speed to maximum speed, and from maximum speed to complete stoppage. The stoppage of the frames should be made as prompt as possible. This reduces the delivery somewhat before complete stoppage, and so reduces the tendency to make snarls. Always run with spindle rail as low as possible; that is, use as much "drag" as the stock will stand. This will enable winding to take place at a lower spindle speed. Thus, when stopping the machines, as the spindles lose speed, winding continues for a longer period, thus reducing the actual length delivered after winding ceases, when spindle speed becomes too low. We have many times used a little more "drag," obtained by lowering spindle rail, to correct the fault you mention. Try changing your shipper rod, removing the worm shaft. Attach a handle and then instruct the help to stop the machine promptly, but start it gently, yet as speedily as possible. We know of one mill where all the cap frames are equipped this way. If your frames are equipped with individual lifter drive,

have both rails rise and fall together, and instruct the help to stop the frames with the bobbin rail down to lowest position. Otherwise, stop with bobbin rail in central position.

Quick stoppage, correct "drag," and position of lifter—bobbin rail—when stopping, are therefore the suggestions we offer to overcome your difficulty. There is a device applied to ring frames. A clutch on the front roller permits the spindles to be started ahead of the rolls, in order to take up the slack and also remove kinks. This is made by Saco-Lowell Shops for their fine worsted ring frame.

Amount of Size Rayon Will Take Up

We have just started using rayon that is sized, and would appreciate your advice regarding what you consider an average percentage of increase in weight that a 300 denier rayon would take up. (5966)

Yarn that is sized on a slasher or sizing machine and wound on the loom beam can be made to take up from 3 to 10% of size. An average amount for good weaving is about 4 to 6% on ordinary weaves, with medium sley and pickage.

Holes in Dyed Rayon Fabric

We are sending pieces of rayon knit fabric which we have received from our dyer. These are full of holes which the dyer claims are caused by faulty fabric. You will notice that the holes come generally all over the piece and usually have rub marks near them, as in the places we have ticketed. This fabric was knit last June or July, and we used high grade neatsfoot oil on our yarn, which is viscose. The same thing happened in two different fabrics, in about fifteen pieces, dyed into four different colors. We are also sending a piece of the fabric in the raw state, knit at the same time, with the same yarn and oil. Kindly give us your opinion as to the cause of the holes. (5978)

A dyer and finisher of rayon fabrics replies to this question as follows: Wherever there is a stain or streak, the fabric breaks very easily, showing that there has been a tendering action taking place at some time to cause this trouble. The gray piece is apparently all right for strength.

The question is, will the whole piece be just the same. It is rather a hard matter to say whether the dyer is to blame or the fabric is at fault. Judging from the experience of some mills, it is wrong to let rayon lie over a month in the oil before scouring and dyeing.

One of the contributing causes for the tendering of rayon in process is the oxidation of the oil, which will tender the fabric and cause it to dye unevenly. Scouring at once therefore saves some trouble. Though there is some benefit derived from scouring before the pieces are allowed to lie too long in the oil, it is also detrimental to have the pieces lie around too long after scouring and before dyeing. Some chemical action takes place in the cloth which is injurious.

If the dyer did not have any tie-ups in the kettles during the dyeing operation, so as to put undue strain on the cloth, and did not have any trouble with his dyeing, I would say that the trouble is in the fabric, because it has been knitted up and allowed to lie too long before dyeing. I have had pieces with holes and that have been streaked. Upon investigation, I found that they had laid around longer than usual. Therefore, deterioration seems to take place whether the goods are held with the oil in them or are scoured; but I believe that the oil hastens the process.

If the fabric is in good physical condition before it goes to the dyehouse, and the scouring, dyeing, and drying are carried out with little or no trouble, the cloth should not break down as in the samples. Of course there is a possibility of the fabric being tendered by scouring or preparing for dyeing. Not knowing how the goods were treated before dyeing, I am assuming that no strong chemicals were used, which could cause trouble, and that the tendering is due to the fabric lying too long.

Ripple Broadcloth

Enclosed is a sample of a fabric that has a wave or ripple in the finish. I have experienced difficulty in making a fabric of similar nature. I am sending you the exact layout of a piece that I have tried. The resulting fabric has no ripple and as this is an entirely new finish to me I am writing to see if you have had any inquiries on this subject. Perhaps there is some way to get this ripple and if you

have any information that you could give me I should appreciate the same. (6166)

The fabric is what is known as a ripple broadcloth. In finishing it should be processed as follows: Wash, then full, wash again, put on wet teasel gig (run with cold water and very wet), put on vacuum extractor taking care not to disturb the nap, then wet decate the piece. This last process will give the ripple. Without wet decating you cannot get a permament ripple. Next in order would be the dyeing, taking care that the water running off the piece in the kettle runs with the nap; in other words, let nothing rough up the nap when it is once laid. After dyeing return to the wet teasel gig to straighten out the nap. Dry, shear, steam and press. Under no circumstances is the nap to be reversed in any machine or operation.

After the above reply was printed we received the following comment:

We have read the question and answer entitled "Ripple Broadcloth," in your issue of July 30, page 41. The writer states that after the goods have been washed, gigged, and put on an extractor, they are wet decated. "This last process," he states, "will give the ripple. Without wet decating you cannot get a permanent ripple."

We have obtained a ripple finish by running the goods wet on a chinchilla machine, the cloth traveling very fast and the head traversing very slowly, using corduroy or carpet at the top platen.

After the goods have been rippled and dyed, the nap is laid very softly with a brush gig just enough to smooth it down. This process is the usual process of finishing broadcloth.

Very truly yours,
CURTIS & MARBLE MACHINE CO.

Oil Stain on Knitted Shirt

We are sending you sample shirt with yellow stain on the front, as marked with pin. We have found these streaks on various fabrics coming through, not only on cotton but also merinos. Our first thought was that this was oil, but our knitter is emphatic that it is not. Inasmuch as we have no laboratory for making a test, we would appreciate it very much if you could get this done for us and advise us what you think the trouble is. (6080)

Tests show this yellow streak to be oil. It can be removed by ether or by the more commonly used solvent, carbon tetrachloride. The oil apparently got on the goods during or after knitting, and passed through the bleaching operations. Fresh oil on the goods after bleaching has a different appearance, and will be found in drops or clusters, and not as streaks. To locate this trouble it would be well to check up carefully your knitting machines, your yarn coming to the machines, and also your cloth as it goes to the bleachery.

Uneven Luster on Mercerized Yarns

We are having some trouble in mercerizing our cotton thread. In dyeing these shades we find that there are some threads with a high luster that dye real light, and other threads of a dark, muddy nature that dye much heavier. I believe it is due to our caustic not being replenished enough.

Could you kindly advise me as to about how many times caustic tanks in a mercerizer should be renewed entirely? Our caustic liquor has been in constant use for the last two years without being changed. Do you imagine that that would have any bearing on the faults that appear on this yarn after being dyed? We take very good care in keeping our caustic liquor the same strength, being tested two and three times a day, and are absolutely at a loss to know what the cause could be. Some lots dye absolutely O.K., and others show deep streaks that I have mentioned before. These colors are all dyed vat dyes, some domestic and others imported. Please give me an outline of the mercerizing process to obtain a very high luster on threads.
(5982)

The streaks described in this inquiry are probably not due to impurities in the caustic, but to some irregularity or unevenness in handling the yarn. The caustic is probably not seriously weakened or loaded up with impurities, although it may look very dirty, but it might well be tested. A sample can be taken at the end of a day's run, when it is at its worst, before any fresh caustic is run in, and the chemical analysis obtained, with the result expressed in degrees Twaddle as it is read from the usual glass, and as it is shown by the analysis. If it is found a little low, the bath can be strengthened to that extent and run at this higher figure to allow for impurities.

Wet yarn containing impurities is continually entering the caustic, but yarn soaked with the caustic is being continually taken out. If there is no caustic recovery or similar complication, a balance should be reached where there is as much impurity going out in the dirty caustic as there is coming in in fresh caustic and wet-out yarn. There is no need to change the caustic unless it is extremely bad.

The writer is not so familiar with the effects of uneven mercerizing on vat dyes but the effects are probably essentially the same as with directs. The difference in luster also confirms the view that it is not ordinary uneven dyeing. It seems almost certain that the light bright streaks have been stretched more than usual, and the dark dull streaks less than usual. With this in mind, look for such things as skeins with uneven length; that is, tight and loose places that would amount to the same thing as uneven tension when put on the poles of the machine; also for distortion by turning on the poles, perhaps before the full tension is on, thus drawing some ends tight. Make sure that the tension is not released until the caustic is all washed out, or the yarn may draw back in places and lose its luster, at the same time dyeing darker. Unlikely as they may seem, investigate all such possible causes of trouble as well as the precautions suggested later.

Getting a very high luster on thread depends largely on having the right staple and twist in the yarn. Assuming this, the writer, from experience, would follow closely the machine manufacturer's ideas on loading and tension, setting the skeins so that when grasped by the hand they can be sprung-in about half an inch from each side.

After a light kier boil and proper loading on the machine, immerse for three minutes (some prefer four) in caustic at 56 deg. Tw., then lift and wring. Start rinsing with cold water and change to warm by the end of the first minute—120 to 140 deg. F. Put in the extra stretch to take up the slack that develops on wetting, and wash until quite free from caustic. Then sour and wash as usual.

Be sure that the yarn is not soured until thoroughly washed, and that the sour is thoroughly washed out before dyeing. Absolute thoroughness in all details is the only way to avoid streaks. Special care is necessary when loading heavily or when the department is being crowded for high production.

Light for Matching Shades

I am the overseer of dyeing at a local woolen mill dyeing mostly piece goods. We have a great deal of trouble over the question of light when matching shades. We have a sawtooth window facing north in my office, but on most days I have to tramp right through the mill to the perchers' department, where they have two very large windows facing north. I find that even in this bright light we get different results at different places under the windows, and get different results on bright days to those we get on cloudy days. I was wondering if we could put in a bay window facing only north in the dyehouse office. That is to say, a window with all sides enclosed but the side facing north. The walls of the dyehouse are painted battleship gray, both inside and outside. Would this affect matching at such a window? I am sure that some of your readers who are dyers, and also yourselves must have run up against such a proposition sometime or other, and will understand the difficulties we get into. (5989)

If it is possible, it would be to your advantage to have the same light condition in your office as in the finishing room. After you have matched your shade against the standard and feel satisfied in your own mind that it is a good match and then take it to the perchers' window, the results should look practically the same as in your office.

If you match off a shade in the morning light, and it comes to the perch in the afternoon light, the chances are that there will be some variation, particularly if you are using different dyestuffs from time to time. You may start with your original formula, and when shading up perhaps you might use different dyestuffs to get the same results. If you do, there will be a variation in the different lights. Try to confine yourself to the dyestuffs in your formula. By doing so, the change of light will have the same effect on the sample and the standard.

It has been the writer's experience that you cannot always stick to your original formula in matching off, for reasons that all experience. The shades come up so that you have to resort to some other colors. When it is necessary to do this, there will be a variation in the different lights against the standard.

This is one of the problems that each dyer has to work out. The man who understands the characteristics of the

different dyestuffs under different conditions is in a position to explain why shades do not match in different lights, and to convince the other party that the match ought to go when he thinks it is all right. Your color scheme of neutral gray for your office is very good.

Specks in Weighted Dye Romaine

We are enclosing herewith a swatch of weighted dye romaine. This cloth appears specked all over, and the specks seem to be darker than the ground. It is just possible that these are undissolved dye specks. However, we believe this will prove of sufficient interest to you to investigate, and we would be pleased to have your findings. (5998)

In our opinion, the inquirer is wrong regarding the cause of the uneven effect. It does not come from the dye but is due to the method of manufacturing. This cloth should have been woven with both of the same twists up at one time, and both of the same twists in the same hole in the filling. The sample sent us has two ends weaving as one, but they have used a right twist and a left twist for their two ends. In other words, the correct method of manufacture is to have the two ends which weave as one, either left twist or right twist. The fact that they have two ends of opposite twist weaving as one allows these two threads, when the goods are in the boil-off and dye, to either overlap or spread, and this accounts for the uneven appearance of the cloth. The place to correct this trouble is at the loom.

Printing Rayon Goods

What special arrangements are necessary on regular standard textile printing machines for printing rayon materials; in other words, what color is used, what base is the color mixed with, whether starch, tragacanth, or other materials? Any comments on special drying and finishing arrangements would be helpful. The writer has not had any experience in the printing of rayon goods, and does not know the colors most adaptable. Therefore, any information you can give me will be very much appreciated. (6143)

Regular basic printing colors, such as are used for ordinary cotton printing, made up with tragacanth or tragasol, give good results on rayon. Printing is followed by regular steaming and washing processes, softening with oil during the finishing and calendering.

Vat colors are also used extensively, as well as aniline black, and these work perfectly. British gum of high conversion is used as the thickener with vat colors, and tragasol with the aniline black. Do not age or steam at any higher temperatures than necessary, about 213 deg. F. for vat, and 195 deg. for black. Blacks should be gassed with ammonia and washed immediately to avoid tendering.

Considerable care must be exercised not to crease goods in passing through the mangles as rayon ruptures very easily. Do not attempt a caustic kier boil. It is best to give a soap scour similar to that used in silk stripping, followed by regular cotton chemic bleaching treatment. Also avoid tension as far as possible while the material is in the wet state.

There are no other precautions and very little if any difficulties should arise. It is doubtless best to tenter twice rather than to try to get the width by one process during finishing.

A print works chemist replies to this inquiry as follows: Rayon materials can be printed in the same manner as cotton cloth. It is the general practice at the present time to use vat colors in order to get good penetration. High pressure steaming must be avoided.

Defects in Cotton-Rayon and Worsted-Rayon Cloths

We are sending you two samples of cloth. No. 1 sample is made up of worsted and rayon; No. 2 sample is made up of cotton and rayon. Cloth No. 1 contains 100 denier rayon. Upon examination you will find that some of the rayon evidently contains 18 filaments and 40 filaments, although it is all 100 denier. There are some bars appearing in this cloth and we would like to have your opinion as to whether or not the bars are caused by the difference in filaments of 100 denier, or the difference in the size of the worsted yarn, which appears to us to run very uneven and exceptionally heavy in places. Cloth No. 2 is made up of cotton yarn

and 150 denier rayon, and we would like your opinion as to what causes the defects in this piece of cloth. (6120)

No. 1 sample is an exceptionally well woven piece of cloth and could not be improved very much, if at all. The worsted threads are fairly uniform and wherever a streak or bar appears it is very faint. Bars and streaks are caused by a fault in the twisting of the worsted and rayon threads. It is a very slight fault, which would be hard to remedy due to the difference between the materials that go into the twisted threads; namely, a very elastic worsted and a non-elastic rayon thread. A few of the rayon and worsted threads have fewer turns per inch than is found in the others. This shows up the rayon a little brighter, giving a light streaky effect when woven into cloth. We are of the opinion that if the sample submitted is typical of the cloth, it is as near perfect as it is possible to weave a fabric of this type.

No. 2 sample shows every indication of a carefully tensioned shuttle. A close inspection of the selvage shows signs of a loosely woven rayon filling. The selvage is very light and would not offer much resistance to a tightly woven filling without showing the effect of the strain on the edges. If the filling was held back by too much friction in the shuttle, a light selvage, such as is found in the sample would clearly show where the filling was pulling too tight. As a matter of fact, the selvage in the swatch shows clearly that the filling has been woven with a minimum of tension. Note the frayed edges of the selvage, where the warp stands out beyond the true edge; this condition in a selvage always indicates a light friction in the shuttle.

The bars or shiners do not extend clear across the cloth. There is every indication that the rayon filling has been damaged before being used in the shuttle. We are reasonably sure that the shuttle cannot be blamed in this case. The filling could be damaged during the winding of the filling bobbins. This is one reason why many mills do not care to weave rayon alpacas, for it is almost impossible to avoid shiners and vari-lustered rayon. This kind of filling shows up very badly on plain woven rayon alpacas. If the cloth has to be printed with large floral patterns, the vari-lustered rayon does not show up very badly, but if

the cloth is just plain dyed the different shades will show up as streaks.

Many finishers will closely inspect the gray goods before putting the cloth into process, and if any of the gray goods show vari-lustered rayon filling, the finisher will inform the owner of the cloth and refuse to accept any responsibility for any streaks appearing in the dyed cloth. Our opinion is that either a poor grade of rayon has been used or that the rayon has been improperly handled during the winding and copping.

Holes in Knit Fabric

Will you kindly examine the enclosed piece of fabric and let us know what in your judgment causes these little holes? (5994)

The fault appears to be what is known in the mills as "cocke-stitch." It is easily prevented by the use of an olive oil emulsion or its equivalent at the winders. Bright silk and bleached yarns are most likely to show this defect in the finished fabric. Highly polished sinkers and needles are valuable aids in overcoming such trouble.

Tinsel Twists in Weaving

In weaving with tinsel filling, when quills are half way run off in the loom, the tinsel comes off in bunches and we cannot keep the tinsel from twisting in the cloth. As this is a flat material, it should lie that way in the cloth. Are there any special shuttles or quills for this? (6060)

Shuttles which have rabbit's fur or other material on the inside, which rests on the bobbin to prevent the material from slipping, should help you. You can get such shuttles from any of the leading shuttle makers. There is a possibility that there is too much power on your picker stick, which causes too great an impact of the shuttle in the shuttle box. This would cause your tinsel to slough off the quill. Possibly if you studied your conditions in this respect it would help you.

As to the tinsel twisting in the cloth, all mills using tinsel in broad goods have this trouble and it is something they have to put up with. The reason is that you unwind overend from the bobbin in the shuttle, and this puts a slight

twist in the tinsel. The shuttles used in ribbon looms do not put this twist in material when unwinding, but it is something that cannot be avoided in weaving wider goods.

Garnetting Worsted Yarn Waste

We use large quantities of worsted yarn waste. There is a percentage of this stock which is twisted very hard and we have considerable difficulty in picking and garnetting it. There will be enough left in the stock that does not break up to cause trouble in the carding and spinning. We understand that some people oil their stock before picking and that special lags are used on the rag picker; also that in some cases the stock is steamed before picking. We have done considerable experimenting with this work and wish to inquire if you can furnish us any information which you think would be helpful. (5990)

The superintendent of a garnetting plant replies to this inquiry as follows: I would advise the inquirer to sort out his worsted wastes and if possible separate his single yarn wastes from the double and twisted yarns. Run separately on pickers and garnetts. Also run finer qualities separately for the finer runs of yarn. Remove all knotted lumps and dirty yarn bunches, especially any bunches that are stained with lubricating oil. These second qualities can be worked by themselves. Fine worsted hard twisted yarns are very difficult to work out into clear fluffy open staple such as is required for finer yarns.

I assume your garnetts are the regular 36 in. or 40 in., 3-cylinder machines, in first class condition, and kept well sharpened up. I am aware that some men object to the cost of overlooking or sorting of yarn wastes. However, a small cost will put waste into stock that will spin finer, and I know it is a paying proposition.

For an emulsion to put on stock before picking or garnetting, I am in favor of using 20 gals. of best lard oil, 20 gals. of soft water, and 5 lbs. borax. Boil for 10 to 15 min. This is an emulsion I have used for 40 yrs. It may be necessary to steam or scour some of your yarns containing dirty oils or foreign matter, or the fine hard twisted yarns which come apart with difficulty.

Another mill man replies as follows: I would suggest that you run the rag picker cylinder in the opposite direc-

tion. Take an emery stone and grind the round point off the teeth. Run the worsted hard waste through the rag picker two or three times.

The garnett machine should be set as follows: Set the feed rolls to the licker-in with a 22 gauge; set the licker-in for the main cylinder with a 28 gauge; set the workers of the main cylinder with a 32 gauge; set the fancy with a 36 gauge; set doffer to main cylinder with a 32 gauge. On second section, the workers can be set with 34 gauge.

Worsted hard waste should be run through a two-cylinder garnett twice. The waste should be run light through the rag picker and garnett machine.

Determining Origin of Raw Silk

In analyzing finished silk fabrics, how is it possible to determine what kind of silk is used, whether it be Japan, Canton, China, or any other kind of silk? (5983)

There is no way to distinguish between Japan and China silk when once boiled-off and dyed. The Canton silk, however, is very soft and hairy or contains a very great number of small loops, but as this condition sometimes also exists in Japan and China silks, hairiness is no positive indication of Canton silk. Products made from Canton silk are usually very soft and highly lustrous, and when the product is also hairy, it is a good guess that it is made from Canton. Often, however, the soft and lustrous effect is produced in finishing, so there is no definite rule to determine the origin of raw silk.

Clothing for Napper

We have just reclothed a napper and we enclose samples of old clothing taken off and the new clothing just put on. We also enclose samples of goods finished on the old clothing. The goods were the same on both sides before napping; that is the cloth has no special side to be napped. We find that we cannot produce the nap with the new clothing that we could with the old clothing. The new clothing raises a small nap and then if the work is continued it rapidly removes material from the surface of the cloth, but the nap does not improve. We feel that the wire on the new clothing is too closely spaced to produce the nap we want. We

would like to have your opinion as to what is the trouble, and if you happen to agree with us that the new wire is unsuitable, please give us your opinion as to what wire we should use. (5997)

Your trouble lies in the clothing. The old wire you took off is a 24-31 angular wire, 45 deg. pitch, open set. The new wire is a 28 round wire, 45 deg. pitch, close set. You are right as to the wire being too closely set for your kind of work. We want to call your attention to the stiffness of the old wire, caused by the hardening of the foundation. Oftentimes this is an asset in napping certain fabrics. This is the reason that a new flexible wire does not equal the finish given by the old wire. You can overcome this difficulty by adding more plies to the foundation. This helps to reproduce the condition of the old wire. This does not apply to all kinds of fabrics, but in your case we think it is a necessity. We would advise a 45 deg. angular wire, open set, with a 4-ply foundation, and wire set at a slight angle from foundation to knee. You will notice your new wire is straight. We are enclosing sample similar to what we think you need.

Light Streaks in Silk and Rayon Hosiery

We are mailing you two pairs of combination junior misses' hose. These goods are made of combination 150 denier artificial and two threads pure silk twisted. You will note a light streak running up and down the stockings across the rib. Will you please advise us the cause of this? (5996)

If this correspondent had gone into the details of his type of dyeing machine, also stated whether these misses' hose were dyed by a one or two-bath method his inquiry could have been answered more definitely. Most direct cotton brown dyestuffs are liable to streak on three-fiber hose. A few degrees of hardness in the water supply could have caused this light streak, or a small percentage of soda ash in the boil-off, if the hose were not properly agitated and washed previous to dyeing.

The light streak is caused mainly by the lack of a thorough boil-out, and the hose being too crowded in the machine.

These misses' hose seem to have been badly tangled around each other, thereby causing a poor degumming of the two strands of pure silk. A portion of the silk gum or sericin was left in the hose along channels, causing the light streaks. Be certain that your dyestuff is thoroughly boiled up and strain if necessary as a safe-guard. By laying the hose straight or untangled previous to dyeing, whether the dyeing is a one or two-bath method, you will greatly improve the leveling of the shade and do away with the channels that the dye liquor sometimes makes in hose, and which usually cause the streaks after the hose are extracted and boarded up.

Backfilling Low Count Goods

We enclose three different weights and constructions of cloth: (1) 38 in. gray, finished 36 in., 44/40, 8.10; (2) 39 in. gray, finished 36 in., 56/40, 6.85; (3) 35 in. gray, finished 33 in., 28/36, 5.50. We wish to ask if you can send us a backfilling formula for filling these goods practically blind. This size is to be used in a regular backfilling or Tommy Dodd machine. Also kindly advise if it is necessary to completely dry these goods before filling, and can they be filled with one backfilled run? (5992)

The writer has never seen such a low count as 28 by 36 backfilled in such a way that it would stay practically blind. The samples No. 1 and No. 2, 44 by 40 and 56 by 40, are typical bag goods constructions, the same as are handled by several of the bag goods manufacturers and finishers. In the writer's estimation one concern in the South finishes bag goods in a way which we would term very near perfect without the use of elaborate tenter ranges, etc. This method in itself is one of the reasons for the successful results with the backfilling, and bears more influence than the actual formula.

After goods are bleached, they are brought to a range consisting of scutcher, 5-roll mangle, and 10 drying cylinders, and wound up on rolls of about 2,000 yds. The water mangle is fitted with 3-bar expander, and hot water is used in the water box. These mangles are run at a speed of about 150 to 160 yds. per minute. From here the goods are taken to what is known as a hot mangle, which is nothing more or less than a 3-roll calender of heavy con-

struction. The inquirer will realize that the goods coming from this 10-cylinder dryer and the water mangle are about half dry. This 3-roll calender is built with two combination rolls and a middle driving roll of chilled iron about 14 in. diameter. The combination rolls are about 20 in. diameter. At the entering in the calender is fitted with a 3-bar expander, and the goods are again wound on rolls, about 2,000 yds. This machine runs at about the same speed as the water mangle.

From here they are taken to the Tommy Dodd, which runs as a separate unit. We would emphasize that this machine is of special construction with friction rolls, agitator rolls, and a box of special design to eliminate all air bubbles and air pockets. The entering side of this Tommy Dodd is fitted with a 5-bar expander. The goods are laid down at delivery end over water-cooled drum, and run at 110 yds. per minute.

The formula for filling is approximately as follows:

30 lbs. crystal thin boiling corn starch.
40 lbs. wheat starch.
40 lbs. potato starch.
80 lbs. talc.
40 lbs. calcium sulphate, sometimes known as Mineral White.
3 gals. 50% Turkey-red oil, and about.
15 lbs. of resin size with the necessary bluing to tint starch to proper shade.

This mixture should make up to 100 gals. when cooked. The writer would call particular attention to the fact that the mixture should not be boiled any longer than a few seconds after it actually comes to a bubble, otherwise the nature of the sizing mixture will be brought to a condition where it is not of any use. During the cooking and mixing, the material should be properly agitated. As a matter of fact, concerns in this class of business are using tilting mixing kettles known as dough mixers.

After the backfilling, the goods are taken to a regular cylinder drying machine with six to eight water-cooled cylinders touching the filled side of the goods on water-cooled side. For instance, the first stack of ten cylinders would have five heated cylinders and five water-cooled cylinders. The goods are thoroughly dried over the drying machine and laid down in trucks. Afterwards they are

sprinkled. They are then taken to a heavy 5-roll calender with three combination rolls and two chilled iron rolls with 5-bar expander at entering side and winder at delivery end. The formula above, of course, will have to be varied to some extent, both as to filler, softener, and starch content, to meet the inquirer's needs. We doubt whether anyone can give a backfilled formula which would work in all plants the same way.

Streaks in Warp of Crepe Meteor

We are sending you a sample of crepe meteor. Will you kindly let us know what caused the streaks in the warp? (5960)

The sample of crepe meteor submitted seems to show uneven raw stock in the warp. Holding the sample to the light shows that the streaks are where a number of heavy denier ends appear close together. This was further verified by removing from the sample, where the streaks did not appear, 1800-in. of yarn, which was carefully weighed and found to run an average of 195,000 yds. per pound, which would be 22/24 denier raw. A similar amount of yarn was removed where the streaks appeared and was found to average about 171,000 yds. per pound. The defect in this sample is a rather common occurrence and is due to the variation of size in the raw stock. The streaky appearance is caused by a group of coarse ends appearing together.

Degumming Crepe de Chine

We would be interested to know the process of degumming or boiling-off crepe de chine in the piece before dyeing. What kind of soap or other ingredients are used without injury to the cloth? How long should it boil and at what temperature? How can we ascertain when all the surplus gum is boiled-off? What is the general quantity of soap and water used for a given number of yards of crepe de chine, 4-thread, 3-ply? How many different lots can be boiled-off in the same liquor, and how much additional soap should be added to every subsequent boil-off? When does the shrinkage take place and can the shrinkage be controlled? What effect has too much or too little boiling-off of the goods? (6000)

A silk dyer and finisher replies to this question as follows: As the degumming of silk is essentially a loosening of the gum from the silk thread, which may be later rinsed off, the amount of soap should remain fairly constant. Only the time element should vary, according to the nature of the silk thread and the construction of the cloth. Crepe de chine is made of silk thread which is very tightly twisted, and this type of thread requires more time for the soap to penetrate than a slacker twist thread does.

While other materials than olive oil soap are used for degumming silk, such as sodium phosphate, borax, soluble oils, and silicate of soda, I have obtained good results with a pure grade of neutral olive oil soap. If the water used is soft, a neutral soap should be used. If the water used is hard, the soap need not be entirely neutral but free alkali should not be higher than one-quarter to one-half of one per cent. While most any size or form of box may be used for the degumming process, it is more economical to use a fairly large and deep box for the purpose and the subsequent washing box should be even larger to facilitate thorough rinsing of the gum and soap from the cloth. A box 10 ft. long, 6 ft. wide, and 5 ft. deep will hold about 2,000 gals. of working liquor. This size box will take from 600 yds. to 800 yds. of cloth.

The starting bath should have 100 lbs. of olive oil soap. The soap should be completely dissolved and the whole solution brought to the boil and the cloth entered. After the entire batch has been entered and wet out, the steam should be turned down so that only the slightest boiling action may be noticed. It is desirable to have the steam pipes run around the entire four sides of the box, or at least three sides, and have the pipes protected with a perforated wooden cover, so that the direct steam may not hit the cloth. It is also desirable to line the box sides and bottom with heavy canvas. The pieces should be gently agitated and the goods allowed to soak for two hours. The pieces are then run over the winch, which should be of large diameter and made of wood, and run into the rinse water. Rinse water should be about 130 to 150 deg. F. Generally, two hot rinses are sufficient.

The degumming bath may be used over again about four or five times, depending upon its condition. For subse-

quent baths, 75 lbs. of soap is sufficient. When the soap bath becomes very heavy with silk gum, it is advisable to draw it off and either throw it away or use it for making up dyebaths.

When the silk piece is thoroughly boiled-off, the cloth will be soft and pliable and have a decided scroop after the gum is washed out of it. If the gum has not left the silk, the cloth will be harsh and sticky and show dull looking places. Shrinking will take place both during the boiling-off and durnig the dyeing operations. The more the pieces are worked, the more they will shrink. This feature is generally corrected on the tentering frames after dyeing and finishing. Too much boiling will spoil the silk, deaden the luster, and fray the cloth. If not enough time is given to the boil-off operation, no particular harm will result to the silk, except that it will not be thoroughly boiled-off and the piece will not dye evenly.

Causes of Yarn Breaks in Knitting

The attached sample of knitted fabric is made with a 3s mule spun yarn for underwear. We use 1 in. stock graded strict middling hosiery for this. Breaks occur in the knitting at times; never regularly, and each break is a fine end. It has all the appearance of cut yarn, with the exception that it does not appear at any fixed length or place as cut yarn due to mechanical faults usually shows itself. We would like you to have it examined and give us your opinion. (6015)

After a close examination of the holes in this rib fabric, it seemed quite clear that each hole was the result of a broken strand of yarn. Analysis of the fabric and examination of the individual yarns showed that each yarn was uneven, having very pronounced thick and thin places in spots. Each hole in the fabric seems to be the result of a fine place in the yarn strand, and as in raveling some extremely thin lengths appeared, this seems to explain the reason for breaking. The cause of the thin spots, however, is another story. This uneven yarn may result from various reasons, but where the variations were so frequent, it would seem that they were a spinning defect. Analysis of the yarn for staple showed a cotton which did not appear to average 1 in. While some of the fiber was 1 in., much of

it was decidedly less. If in spinning, the rolls were set for 1 in., this may be the reason for the variations. Examine and staple the rovings at the spinning frame and make certain of the staple there. Then examine for evenness the yarns made with a proper roll setting.

Sizing Yarn for Braiding

Can you give us information about sizing mohair yarn to condition it for running on braiding machines. We have tried to make a cheaper braid by using one thread of 2/24 yarn on a braider bobbin in making braids up to 14 and 16 lines. We cannot make the yarn run in its natural state without excessive breakage, and wonder if it were sized whether it would run any better. We have tried several manufacturers of size to see if they could help, but there is evidently something required in size for braiding that is different from that required for weaving, as size that was claimed to be satisfactory for other purposes does not seem to help on a braider. We will be glad to have you give us any information along these lines that will help us solve our problem and would appreciate any advice you could give us. (5988)

We do not believe that the sizing for yarns that are to be braided should necessarily be any different from sizing for yarns that are to be woven. Almost any size that is satisfactory for one purpose should be satisfactory for the other. A common size bath for yarn that is to be braided is composed of about 2 lbs. of starch to 12 qts. of water. It is brought to the proper consistency by boiling for a few minutes. A small quantity of cocoanut oil is added.

Mohair yarn is rather difficult to size. The oil that is present in the thread tends to repel the starch and prevent penetration. Therefore, the process of sizing is apt to leave but a slight coating of starch on the outside of the thread just about enough to lay the fiber. Best results will be obtained by keeping the size quite hot. In using any sizing, the choice of ingredients should be made with the knowledge that it may be necessary to pass the braid through an extra operation to remove the size. It might prove impracticable to remove some kinds of size.

The writer is inclined to believe that the difficulties encountered by the inquirer are due either to a poor quality of yarn, or to some needed adjustment of the braider.

hardly seems possible that 2/24 mohair yarn would not run in almost any texture of braid. With yarn that tests anywhere near a standard figure, there ought to be no braiding troubles, whether the yarn is sized or not. We would suggest checking up the braider. The top and bottom weights used on the braider carriers should not be too heavy. We would also advise an inspection of the let-off mechanism on the braider, and all of the eyelets through which the yarn passes. Sometimes these eyelets become grooved and have very sharp edges. On braiding machines where spools with notched heads are used, we would suggest trying an entire set of new spools. Sometimes the notches on old spools become so badly worn as to cause difficulties that are often attributed to the yarn.

Streaked Silk and Wool Fabric—Oil for Yarns

We are enclosing a sample of knitted silk and wool fabric which we have received for dyeing. As orders fell flat, these people had these goods stored in the oil for about eight weeks in our warehouse in their original bales. Then we suggested that they have them scoured in case the spinning oil oxidized, to which they agreed. We then proceeded to scour and put them into stock again. Orders are now beginning to come in and we are commencing to process them, but we find a percentage of them dye up as sample. Can you inform us whether we are correct in assuming that oxidation of oil is responsible for this condition? If so, what is best to rectify it? We understand that a dry spun yarn is used in making up this cloth, but that previous to the knitting operation it is soaked in neatsfoot oil, the same as is used by the artificial silk manufacturers. (6002)

There is no question but that the trouble is due to the cloth lying too long in the oil. I would give the pieces a good boiling out with ammonia before dyeing. If this does not help, I am afraid the people will have to stand the loss. You might try scouring with sperm oil, then scour again with soap. Neatsfoot oil should not be used on silk when it is going to be knitted with wool. It is almost impossible to scour it out. The writer has had the same experience where the cloth laid only a week. The pieces would come up blotchy and with a light streak from one end to the other where the pieces were rolled up.

Olive oil or its equivalent should be used on yarn before knitting, as it is easily removed in scouring. Your scouring of the pieces will prevent any further progress of the trouble but cannot arrest the damage already done. The writer, in scouring rayon, gives it a good hard boiling; scouring twice at the boil with a heavy soap and alkali to be sure, so far as we can, that the neatsfoot oil is practically all out of it. Silk and wool fabrics are scoured at 120 deg. F.

Finishing Cotton Cloth with Rayon Stripe

We enclose herewith a sample of one of our cloths with a rayon stripe. You will note how it has buckled in the process of bleaching and dyeing. We also enclose sample of the same cloth in the gray. We would appreciate it very much if you could let us have some information with regard to what you consider the cause of this defect. Cloth is being woven on the looms with the silk about as slack as it possibly can be. (6009)

It is quite apparent that the cotton mill manufacturing this fabric has done all in its power to have the rayon warp stripe woven into the goods under as little tension as possible. They could not overcome in the weaving the pronounced fault which shows in the goods. It is barely possible that the finisher can overcome the difficulty if he will finish on a tenter as near gray width as possible. The inquirer will understand that the weaving mill cannot make a 39 in. gray fabric of this construction to be finished 36 in. wide and have the rayon stripe in the warp work out correctly in the bleaching and finishing processes. It appears to the writer as though there should be no more allowance between woven and gray width than 1 in. That is, 36 in. finished goods should be woven 37 in. The finisher of course will realize that he can only definitely arrive at the proper results after experimenting with the finished widths.

The writer would suggest allowing the goods to go on the tenter frame in fairly wet condition in order to obtain a definite production. The tentering range should consist of six drying cylinders; a 90 ft. tenter properly housed with insulated materials and housing fitted with an efficient hot air drying system; and a winder at the delivery end of the tenter.

Water Stains or Dry Marks on Knit Underwear Fabric

We are manufacturing cotton and rayon knit underwear, latch and spring needle. We use pipe dryer equipment for drying our cloth after extracting. From time to time we experience what we call water stains in the fabric. These are noticeable when the cloth is passing from the dry pipe over the spreader to the take-up. This trouble is particularly prevalent in our navy blue and green cloth. We would greatly appreciate it if you have any information you can pass on to us, advising the cause and how to overcome this trouble. (6037)

These water stains, sometimes called dry marks, on your cloth are caused by the heat of the metal pipe warming the wooden slats. When any part of your fabric touching these slats dries out before the other parts, this mark will appear. Wetting out the cloth again will remove the marks.

The only way to overcome this trouble is to rebuild your pipes so that you will have a layer of non-heat-conducting material between your metal pipe and the outside slats, thus keeping your slats as cool as possible. Powdered asbestos is used; also a heavy layer of sheet asbestos is used to good advantage. These marks will be more pronounced on the dark shades.

Bleaching Outing Flannels with Colored Stripes

We have been bleaching outing flannels in our mills for a number of years very successfully, but now we want to bleach goods with indanthrene stripes. We have a pressure kier. We attempted to boil the goods in the kier with 3% caustic soda and 3% of an assistant. When we opened the kier the colors had completely faded. Was it the caustic or the pressure that faded the color? Can we boil this grade of goods, or rather I should say indanthrene dyes, in a closed kier? If so, with what chemicals can we obtain the necessary boil, in order to get a good bleach? We bleach with chlorine and sour with sulphuric acid. The chlorine and acid do not affect the color at all. I am enclosing two small samples to show you better what I am driving at. These samples I did in a laboratory way, in an open kettle. Of course we could not do this in a commercial way. (6004)

The bleaching of outing flannels or similar cotton fabrics which are woven with colored stripes or other patterns has become an important branch of the bleaching industry. Vat colors, among which are included the indanthrenes, are used largely for producing these colored effects. While the vat dyes are considered to have the best all-around fastness properties, it is recognized, nevertheless, that all members of this class are not of equal fastness. Thus one color may withstand boiling with caustic under pressure and yet be changed in shade by treatment with chlorine; while another color may be fast to chemic but will bleed in the kier. The method of application of the vat colors, likewise, has considerable influence on the fastness properties of the dyeings.

Knowing these facts, it is evident that no hard and fast rule can be followed in the bleaching of cotton piece goods with colored patterns. The following suggestions should prove helpful, however, to the bleacher handling this class of fabrics:

Before attempting to bleach the goods, a small sample of the cloth should be run through the various processes to determine the fastness of the dyeing. It will be found that some fabrics can be handled in the usual way for goods without colored effects; others will require a modification of the method, and occasionally fabrics will be encountered which cannot be bleached by any process without bleeding of the woven pattern.

As a general rule, boiling with a strong alkali or under pressure should be avoided. In many cases kier boiling may be dispensed with, the goods being treated in rope form in the Rodney Hunt reel machine or a similar type of apparatus. The following procedure is recommended:

(1) Treat 30 to 40 min. with desizing compound.
(2) Wash with hot water.
(3) Boil 1 to 2 hrs. in soap solution to which a small amount of soda ash has been added. The presence of a mild detergent, such as Turkey-red oil is often of advantage in this bath.
(4) Rinse well with hot water and then with cold water.
(5) Bleach with sodium hypochlorite.
(6) Wash, antichlor or sour, and wash.

These operations may be performed either by the batch method in one machine, or, if production is large, by the continuous method with several machines in range.

If it is absolutely necessary to boil the goods in the kier, soda ash should be substituted for caustic soda, and the pressure be kept as low as possible. An open kier is preferable to a closed kier. The bleeding of some of the indanthrenes is lessened or prevented by the addition of 2 to 3 lbs. of Ludigol to each 100 gals. of kier liquor. Potassium bromate has also been recommended to prevent bleeding in the alkali boil.

Some vat-dyed fabrics change color when bleached with chlorine. As a rule, a subsequent treatment with dilute sodium bisulphite solution is sufficient to restore the original shade. It should also be noted that when the chemic method is found impractical, the use of hydrogen peroxide for bleaching fabrics containing colored yarns is often useful.

Uneven Silk in Hosiery

I enclose herewith a pair of 7-thread full-fashioned hose made of double extra crack silk with mercerized top, toe, and heel. You will note these hose are very badly barred and we figure that they are only fit for seconds. We understand of course that this fault is caused by uneven silk, but we would like to know whether anything could be done in the manufacture of the hose; i. e., winding, moistening, knitting, dyeing, and finishing—which would reduce the high percentage of seconds such as these. For moisetning, during winding, we use an emulsion of silk oil, olive soap, and water. Can Italian silk be used for very light shades and white? (5977)

The trouble is one of the most conspicuous that we have seen recently. It is a matter of the quality of the silk. A good Japanese silk should not give such conspicuous bands as this. We know of no way to remedy or cover this defect of the silk except to make heavier hose, as for instance, a 14-thread of two of these ends. Today, however, there is but a very limited market for hose as heavy as 14-thread.

We call your attention to the fact that the leggers and footers do not seem to be making quite the same texture in this pair of hose, which causes a band over the instep. When

worn, this defect is less conspicuous in light colors than in dark colors. This is because there is not a great contrast between flesh color and these light colors, while the darker colors like gunmetal or black have a great contrast and every band stands out distinctly. We see no reason why the Italian silk could not be used for any color desired.

Conditioning Dyed Silk for Full-Fashioned Knitting

I would like directions for mixing the emulsion used for ingrain silk on the winding machines, just before it goes to the knitters. We understand that some concerns use simply an olive oil soap solution, but we have not been able to make a satisfactory solution that way, possibly due to the fact that we do not use the right proportions. It has been suggested that only plain water will be necessary on the wick at the knitting machine, but we use no wicks at all. We wind our silk damp, and it is kept in damp boxes on the machines, and kept damp by blowing, if necessary; but runs over no moistening wicks on the knitting machines. We used to do that when we made gum-silk hose, but then we could use oil enough on the needles to offset the action of the water. (6008)

The superintendent of a full-fashioned hosiery mill replies as follows: Soft water is the only proper thing to use in knitting ingrain or dyed silk on a full-fashioned machine. The silk should be wound wet at the winders and kept in damp boxes, whether waiting to be used or on the knitting machine. Do not use wicks on the knitting machine as the silk will be wet enough, and any drag is bad, as the silk must run as smoothly as possible from the spool to the needles. The use of an olive oil soap solution of say 1 lb. of soap to 50 gal. of water, boiling the soap to a jelly in about 2 gal. of water, then adding the rest of the 48 gals., could do no harm but it is not necessary.

"Crowsfeet" in Silk and Cotton Crepe

I am enclosing three cuttings of a heavy silk and cotton filling crepe. One cutting is the gray cloth and the other two are specimens of our finished work. Upon examining the finished cuttings you will observe that they are full of uneven streaks or crowsfeet in the crepe. These goods were degummed in a tank and the defects became apparent

early in the operation. The goods were then dyed in kettles. Will you please tell me how to overcome this trouble? (6032)

The tension on the filling is uneven so that the cotton does not lie straight. After the goods have been degummed, this causes an uneven effect. Shrinkage is a natural occurrence in the boiling-off process. After the goods have been degummed and dyed they should be run over a tenter frame to give the desired width, and then through calenders in order to smooth out the cloth. The crowsfeet discernible are not due to the boiling-off, but particular attention should be paid to careful handling during this process, and the other operations must be gone through before the goods are fit for the market.

Horizontal Streak in Silk Stocking

We enclose a pair of ladies' silk hose, on which we would like to have your report as to the cause of the ring marks, which appear to us to be due to the silk thread running thin in places. (6023)

The defect in these real silk full hose is a prominent horizontal streak, apparently of different color than the rest of the stocking. The streaks happen to be just in the section of the fashion marks and so are conspicuous. Examination shows that the streaks are about one course wide.

A study of this streak under a pick glass showed that the color did not seem to be really different and led to the idea that the silk was finer for that course. This was particularly possible as a knot appeared at each streak, indicating that the new end might be of a different size. As the streak was caused by so short a length of yarn this did not seem just right, and so the raveled yarns were examined under a microscope. This showed a new development. The yarn from the defective course seemed to be harder twisted than the yarn from the normal fabric. Tests on 3-in. lengths taken about every 6 in. showed the following twists per inch:

Normal	Defective
12	33
8	38
5	39

9	42
9	43
12	37
10	41
8	21
6	12
12	15

These figures showed rather conclusively that there was an excess twist in the silk yarn where the streak occurred. This made the strand seem smaller in diameter and in addition made it look darker in color. (It is a well-established fact that twist has an important bearing on the apparent color of a yarn.)

As each streak came where there was a knot on the combined filaments, the only likely cause is poor twisting or throwing. When tying in a new end, the girl apparently let the bobbin turn with the spindle while holding the yarn for knotting. In this way, directly before the knot, the strands were twisted more than normal. The defect seems to be entirely due to careless twisting of the silk yarn.

Heavily Starched Finish

Enclosed find clipping. If possible, the writer would like to know the starch formula used to get this finish. Would it be possible to give a firmer finish and yet have the cloth elastic; that is to say, if the cloth was folded or creased have it able to spring back to shape and not show cracks where it was folded or creased? (6035)

An examination of the sample submitted showed that the cloth was very heavily starched, containing approximately 40% of finishing materials. In the opinion of the writer it will be rather a difficult matter to weight goods of this construction so that they will have a firmer finish and at the same time be more elastic.

To duplicate the finish of the sample it is suggested that the following recipe be tried on a short run of the fabric. The proportions may then be varied and ingredients added to produce the exact results required:

100 gals. water
50 lbs. corn starch
50 lbs. dextrine
15 lbs. glucose

The addition of from 25 to 50 lbs. of Epsom salts to this formula may prove advantageous.

Gum Spots on Silk and Rayon Hosiery

We would appreciate any information you may be able to offer us with the object of solving the following problem: In the dyeing of a hose made of 150 denier rayon plaited with 3-thread tram, we find that in the boil-off some small balls of gum attach themselves to the hose. We do not understand why the gum does not remain in solution, and wonder if it is due to the excessive quantity of magnesium salts that our water contains. If this is the case, is there any way in which we can overcome the difficulty? And in what manner can these particles be removed once they have embedded themselves in the hose? (6040)

Any appreciable amount of magnesium or calcium salts in water used for boiling-off silk may cause the spots complained of. This is due to the insoluble calcium or magnesium soap formed with the boil-off medium. The best cure for this difficulty is, of course, the installation of a water softening plant.

Stains on Sulphur-Dyed Fabrics

We are having a great deal of trouble with the dyeing of the enclosed material. After the goods are dyed with the sulphur khaki, there appear in one or two places in every piece black streaks and discolorings, such as show in the dyed sample enclosed. The sample was not diastafored before dyeing, but we have tried diastaforing this material and the extra process does not get rid of the black streaks. We would esteem it a favor if you could put us next to what is causing this trouble. (6034)

An examination of the goods dyed with sulphur khaki failed to disclose the exact origin of the stains. Stains on sulphur-dyed fabrics may arise from any one of several conditions. Without further details as to the method of handling the fabric, it is impossible to do more than to suggest probable causes of the stains and precautions to be taken to avoid them.

The sample submitted shows two distinct types of stains; a dark blotch or discoloration which often occurs in goods which have not been properly desized, and a heavy brown streak which points to insufficient washing after dyeing.

The preparation of the goods for dyeing is of great importance if satisfactory results are to be obtained. It is suggested that, before dyeing, the material be treated as follows: diastafor, wash with hot water, scour with soda ash and Turkey-red oil, and dry.

In dyeing, it is important that sufficient sodium sulphide be used to entirely dissolve the color. The addition of a small amount of soda ash to the dyebath is recommended.

After dyeing, the goods should be thoroughly washed before they are after-treated. It has been found, in the continuous dyeing of sulphur khaki, that it is often necessary to heat the water to insure thorough washing of the fabric; this is particularly true during the winter months.

The use of copper drying cans is of course to be avoided, and it is important that tinned cans should have brazed and not soldered seams.

Uneven Construction in Stocking Fabric—Distorted Loops

Enclosed please find one stocking which shows an uneven construction of fabric below the welt and above the fashion marks. You will note that this unevenness in the construction of the fabric ceases where the ankle tension and the fashion marks begin. At the present time we are having a considerable amount of trouble of this kind. Any information you may be able to give us in the way of remedying this defect will be greatly appreciated. (6017)

This defect is really a series of horizontal streaks, but in this sample they are so general as to give an all-over effect in the upper part of the boot. There are certain wales, however, that seem to be rather worse than the rest of the sample.

Close examination under a pick glass will show that these streaks are due to the loops of one course being inclined somewhat to one side of the normal loop position. In this position they reflect light differently than the rest of the fabric and so make the streak.

There have been several explanations given as to the cause of this, but the one we are most inclined to credit is the theory that the silk or rayon is being knitted on too coarse a machine for its size, and so the loop is relatively loose. When this is true, the loop is more easily distorted than when knitted to a normal sized loop. Thus any stiff-

less in the yarn may cause trouble here, when it would not with a smaller (or tighter) loop.

The direct cause is, we feel, that the yarn has an uneven amount of emulsion or moisture, being drier at some places than at others and causing the distorted loops. To remedy this get an even distribution of emulsion or moisture and do not let cones or bottle bobbins stand around long enough to dry out on the outside and ends before knitting. See that the needles are all alike and the hooks are in a perfect circle to prevent one group of wales being worse than another.

Manufacturing Braided Shoe Laces—Equipment and Methods

Kindly give information covering the following questions: What kinds or makes of braiding machines are used in braiding flat and round shoe laces? What grades, plies, and sizes of yarns are mostly used? What are the number of twists and the construction of yarns? What form or put-up is required by the machines? What data have you available as to the number of yards of braided shoe lace of a definite width that can be obtained from a given number of pounds of yarn? What kind of tipping machine is used? Is yarn generally dyed and then braided, or is yarn usually braided natural and then the braided shoe lace dyed? What are the costs of manufacture covering any general type of shoe lace? Having asked perhaps quite a few questions, I will certainly appreciate whatever full and complete information you can give; also any other information as to any other equipment which is necessary for the manufacture of shoe laces. (5999)

There are several makes of braiding machines suitable for the manufacture of flat or round shoe laces on the market. Names of builders have been sent to the inquirer. There are a number of different sizes in each make. For instance, one company's machines are listed as 16s, 24s,—32s, 44s, 48s, 64s, and 72s. These sizes correspond to the number of carriers or bobbins to be run on the machine. The size of the machines required will depend to a large extent on the quality and texture of the desired laces.

The yarn used depends upon the quality of the shoe lace desired. Shoe laces are made in a wide variety of qualities. The yarn sizes most commonly used are as follows: 16/1,

20/1, 26/2, 30/2, 36/2, 40/2, 50/2. The yarns may be plain cotton, mercerized, or glazed. They may be used one, two, or three ends on a single bobbin. Yarns must be spooled on the special bobbins that are required by the make of the braider used. The different sizes of machines of one make usually take the same kind and size of braider bobbins, and so the bobbins are interchangeable.

Width in braid is a very indefinite term; so much depends upon the elasticity of the texture, the tension under which the material is held, and the size and finish of the yarn. However, the weight of the braided material should not be less than 98% of the weight of the raw material; not more than 2% being allowed for waste and shrinkage. On large orders, this allowance may be reduced to a fraction of 1%. Given the weight in grains of a shoe lace, tips removed, it is a simple problem in arithmetic to determine the number of yards of braid per pound of raw material.

Tipping machines also are made in a number of different styles, and it would be well to compare the specifications of manufacturers whose names we have sent to the inquirer.

The method of dyeing is a matter of opinion. Each method has its advantages and its drawbacks. Much depends on the size of the orders. Small orders for special colors are probably best made in the gray and dyed after braiding. This method eliminates the small amounts of colored yarn that are bound to be left over on each order for special color.

The subject of costs is a very broad question. Many factors enter into it, besides the general and quite natural disinclination of business houses to divulge their private business. Much depends on the size of the plant; whether the floor space is owned or rented; the proximity and quality of the available labor; the efficiency of those in charge; the policies of the concern, etc.

The following paragraphs deal with equipment other than that previously mentioned: Spooling machines will be necessary to convert the yarn from tubes to braider bobbins. A skeining machine will be needed to put the braid in proper shape for the dyer. Some arrangement will be necessary to convert the dyed braid from skeins to a form suitable for cutting. If any of the material is to be dyed before braiding, a skein winder will be necessary to spool

the dyed yarn. Information concerning any of these machines may be obtained from textile machinery concerns.

An automatic cutting machine is made by the Artos Engineering Co., Milwaukee, Wis. This machine can be set to cut any desired length and once adjusted requires very little attention. In estimating power required, it is safe to figure a 5 h.p. motor for the operation of 2,000 carriers.

Stickers and Shires in Silk Weaving

What causes stickers in weaving 20/22 silk crepe de chine. There are two warpers working on the same warping machine; one warper's work has no stickers and the other warper has stickers. Kindly let me know what causes shires on 6-shaft satin. There are 15,000 ends, 92 picks, 3-thread Japan filling. When filling runs out of shuttle the loom stops 1½ in. before front center; that is, the reed would be 1½ in. in front of the last pick. Vibration of the floor causes the loom to rock. Would that cause shires? (6028)

The fact that two warpers working on the same frame turn out different grades of work would lead to the conclusion that the machine itself is mechanically perfect and that the stickers are caused by the workmanship of the operator. A warp of 15,000 ends is quite a heavy warp, and it is of the utmost necessity that a warper be very careful in making a heavy single-end warp of this construction.

Stickers are often caused by the creel being too far off-center; also by improper reeding and by the spread cords cramming the section too close as it leaves the last roller. They are also caused by the warper not running with an open cross. It is further of the utmost importance that the warper, in running with an open cross, makes sure that it is not put in so that it is bucking the last cross. Plenty of tension should be used in beaming and sufficient paper used. Extreme care must be used not to overlap sections.

Shires may be caused by poor friction ropes or loose lay. Looms should further be checked to see that picking and shedding are as even as possible. Vibration of the loom is very apt to cause shires. At best, the above weave is a wild satin and cannot be made to lift absolutely even, and it often shows very unevenly on the back. The inquirer states that the loom stops an inch and a half in front of the last pick. He no doubt means that it stops an inch and a half

before dead center, in back of the last pick. The brake bands on the loom should be tightened up to the greatest possible degree without the loom binding, and the loom should stop if possible at the last pick at fell of cloth, before turning over. On the older type of loom this a very difficult task, and it is one of the reasons that so many weighted crepes in the market today show these stop marks.

Reason for Rayon-Filled Fabric Lacking Luster

I am enclosing two swatches of a summer suiting which are marked A and B. The yarn pasted above each swatch is the filling used in that swatch. It is cotton veneered with rayon. Five turns per inch are used. Will you please tell me, if possible, why swatch B has so much more luster and such a better handle than swatch A? The rayon in A seems to be dead and flat, while in B it seems to have a lot more life and pep, and also looks a lot better. Any information which you can give me will be greatly appreciated. (6036)

Swatch A counts 46 x 44, 2/20s warp; swatch B counts 41 x 40, 2/20s warp. The same kind of warp and filling are used in both swatches. The distribution of warp and filling in A and B is equal; that is, there is as much warp on the face of both cloths as there is on the back.

The heavier sley in swatch A is one of the reasons for the lack-luster appearance of the rayon, but the real reason is the weave. It is a set weave; that is, the warp and filling cuts on every pick or at every intersection of the warp with the filling.

This type of weave has a tendency to bind the rayon filling in too tightly, preventing the filaments of the rayon from spreading out or curling up. Swatch B, while having the same distribution of ends and picks on the face and back as swatch A, is of a lower sley and pick. This makes the cloth more open in character. But it is really the weave that makes the difference in luster.

In swatch B the warp ends do not cut with the filling on every pick. On every pick the filling floats are allowed to slide into each other. This permits the picks of rayon to come together on every other end as well as pick, and the nature of the weave is such that the picks are given a slight

curl where the two rayon picks are permitted to come together.

A good way to prove this is to introduce the weave that is used in swatch B into swatch A. While there will be a slight difference owing to the higher sley of swatch A, this will prove that it is the weave and not the warp or filling that is responsible for the lack-luster appearance of swatch A.

Cross Streaks in Crepe Satin

We are enclosing a sample of satin and would ask what in your opinion is the cause of the cross streaks in the filling. Is it uneven twist, uneven silk, something in the tinting which does not take the dye, or is it something else? We would like to go to the bottom of this. (6045)

The sample of crepe satin submitted is quite a heavy construction in pure dye. The bars mentioned are hardly perceptible in a short piece such as was submitted, but careful examination shows them very faintly. This defect is prevalent today in a greater or lesser degree on all constructions of this character. Holding the sample to the light shows a distinct unevenness in the filling itself, which it is almost impossible to eliminate completely. It does not look as if these bars are due to faulty weaving, nor can they be attributed to the rope tension.

Stains in Worsted Skeins

Enclosed you will find a skein of knitting yarn that has been returned from the dyehouse. Upon close examination you will find a discoloration. I am unable to account for this. I would appreciate any information you may give me that will help to explain how it occurs. (6046)

The stained condition is due to carelessness in handling the yarn before drying, as the skein is stained only on the outside. The yarn may have rubbed against something that stained it, drippings from the roof may have fallen on it, or carrying the yarn by a dye kettle that was throwing liquor might have caused the trouble. Even under the best conditions it is hard to keep bleached yarn clean. You will have to take extra precautions in handling to keep the yarn from being stained.

Laboratory Fulling Test

We are interested in making laboratory tests on woolen yarns for fastness to fulling. We wish to use a process equivalent to one, two, and three hours' fulling in a mill. If you have any formulas available as to ingredients to use, quantities, and temperature, we would appreciate very much to be favored with same. (6049)

The test given in the 1926 Year Book of the American Association of Textile Chemists and Colorists, covering methods for fulling tests, may be helpful. It is as follows: Take 2½ gm. of dyed yarn and braid it with smaller amounts of white wool, cotton and silk, in such a way that the dyed wool makes good contact with the three undyed fibers. The weight of the dyed wool must be at least equal to the combined weight of the undyed material. The solution for test contains 5 gm. of white neutral soap and 2 gm. of soda ash per liter. Soak the braided sample in 150 cc. of the above solution for 16 hr. at room temperature. Then heat to 140 deg. F. Remove from the bath and mill briskly on a scrubbing board until the wool is thoroughly felted. Rinse, dry, and unravel for examination.

A test made in this way compares fairly well with a 2-hr. fulling in a fulling machine. It can be varied to suit your requirements.

How Should Warp-Face Sateens Be Woven?

I observe in the Jan. 15 issue of TEXTILE WORLD, under the head of "Rayon Fabric Uneven in Filling," that the writer says it is a bad practice to weave the warp-face sateen with the face down. This is an extraordinary statement for the regular practice of the trade, both here and in England, is to weave sateens with the face down. In the case of a 5-harness to weave it with the face up 4/5 of the warp would have to be raised with every pick; with the face down, 1/5. In an 8-harness, ⅞ of the warp would be raised with each pick and ⅛ with the face down. The consequence is that in the 5-harness, 4/5 of the warp is, with every pick, exposed to a weaving stress instead of 1/5; and in an 8-harness ⅞ of the warp is exposed to the stress instead of ⅛. In addition to that, there is the increased power required for raising these harnesses. This is the practice within my experience, and it is equally so within that of the many

people with whom I have at times discussed this subject. This applies to all kinds of materials—silk, worsted, cotton, and linen. (6026)

The author of the answer referred to in the inquiry replies as follows: We still maintain that it is a bad practice to weave warp-face sateens with the face of the cloth down. It is recognized as bad practice, not alone by practical weavers, but by loom builders. Most all of the heavy and medium weight corset jeans, lingettes, and venetians are woven with the face side up. Where warp flush sateens are woven with the face of the cloth down, these cloths are probably woven on a negative motion dobby. This type of dobby employs springs for pulling the harnesses down to the bottom shed. The reason why warp-face sateens are woven face down with this motion is that it is a difficult matter, when using springs, to bring the shed down to the race plate.

If a warp face sateen was woven on a positive motion dobby, and a practical weaver was responsible for the weaving of the fabric, the cloth would be woven face side up. A positive motion dobby works on the principle of the cam loom; no springs are used, the motion for the up and down sheds being positive.

The foremost loom builders of the United States, England, and Germany build the face-up cam motions for the weaving of warp-face sateens, and practical weavers in these countries use them almost exclusively. A large number of venetian motions for the weaving of the 8-end venetian sateen are built, and these are made to weave the cloth face up; that is, 7 harnesses up and 1 down. Mills that formerly wove the venetians on the negative motion dobby looms were quick to take advantage of the 8-harness cam motion (7 up and 1 down) because of the better weaving properties of the cams and the fact that the face of the cloth would be under the eye of the weaver at all times.

Practical weavers know that the sheds of a heavy sleyed sateen are better balanced when the bulk of the warp is up during the weaving, and that the warp is subject to less friction, due to its position in the reed. In the case of a 5-end sateen (warp flush) woven with the face up, the correspondent makes a very extraordinary statement when he says that 4/5 of the warp would have to be raised and

lowered on every pick. If a dobby was used there would only be one harness changing on each pick, and if cams were used there would be only one harness changing on each pick. Instead of 4/5 of the warp being raised and lowered on every pick, there would be only 1/5 of the warp raised or lowered on each pick. On the obsolete Witch head motion, in use over a generation ago, and the close shed jacquard, if a warp-face sateen were to be woven face up, 4/5 of the sley of a 5-end sateen would rise and fall on every pick of the loom. The modern open shed jacquard, dobby, or cam loom will weave a 5-end warp-face sateen, face up, with a movement of one harness only on every pick. The same applies to the 8-end sateen; that is, one harness only would change on every pick and there would be 7 harnesses up on every pick.

The writer's answers to questions deal only with modern methods used in weaving and designing cotton cloths, and machines that are up-to-date. Old type motions are not considered in most cases, although we do consider, in a limited way, the close shed jacquard machine, which has its uses for the weaving of special fabrics.

Redyeing Ribbons

Enclosed you will find three ribbon swatches; one gray, one copen, and one navy. We are having trouble in our ribbon dry dyeing department in trying to make a navy out of the gray and copen. The navy swatch as you will notice has been dyed from the gray swatch in one dye, and it comes out greenish on one side and reddish on the other. We also have the same trouble with the copen swatch when we make navy. Our dyeing is done with basic dyestuff, denatured alcohol, and water. We would appreciate it very much if you would tell us where the trouble lies. (6050).

On account of the meagre details it is difficult to give an exact cause for the unevenness noted in the dyed shade of navy blue ribbon. From an examination of the gray sample, it is evident that the ribbon is composed of a very heavily weighted silk warp with a rayon filling. A wash test shows that it is probable that the original piece of gray ribbon was dyed with direct dyes. Certain direct dyes have an affinity for both rayon and silk, but when the ribbon which has been dyed gray with direct dyes is later treated

in a solution containing a basic color, several things may happen. The direct color under certain circumstances may act as a mordant for the basic color and, were there only one fiber involved, the process might be satisfactory. But tin-weighted silk has an increased affinity for basic colors, and it is probable that the silk has taken up the basic dye faster than the rayon, and this is one reason for the unevenness shown. Again, the water used in the dyeing has dissolved some of the direct dye; this has precipitated the basic dye in the solution, which is another cause for the unevenness. It is also evident that the ribbon was heavily sized after the dyeing, probably with glucose, as it washes out in hot soap. In a material composed of two different fibers, better redyeing results would be obtained if direct dyes had been used, rather than the basic colors. If the complete dyeing history of the ribbons in question were given, perhaps more exact reasons for the trouble could be found.

Chlorinating Wool for Shrink-Proofing

Thank you very much for your helpful reply to my inquiry on finishing of wool knit fabric (No. 6022). I do desire to have a fully shrunk garment, and would appreciate it very much if you would send me a detailed description of the process for obtaining this result, as you offered to do. (6047)

The wool knit goods are first well scoured in a reel machine, using a good wool scouring compound, then thoroughly rinsed with warm waters until clean, and finally with a cold water.

In chlorinating, a wooden or concrete vat (must be smooth) should be used, and great care must be exercised that no tension is placed on the material during this operation. The vats (two are needed) should be of about 500 gal. capacity. In one of the tanks a solution of hypochlorite of lime, 1½ deg. Tw., (approximately 40 lbs. per 500 gal. water) is placed. The lime bleach solution should be mixed in a separate receptacle and the sludge allowed to settle before using. In the second vat, a solution of muriatic acid, 65 lbs. (of 35% acid) per 500 gal. of water is prepared.

The material to be treated is immersed in the chlorine bath for 16 min., after which it is lifted and allowed to drain. (Do not rinse.) It is now entered into the acid bath and kept immersed for 15 min., lifted and drained; reentered in the chloride of lime bath, kept immersed for 15 min., lifted and drained; and again entered into the acid bath, allowed to remain therein for 15 min., and then thoroughly washed with cold water. This treatment gives a yellowish color to the wool which may be removed by treating with a solution of sodium bisulphite (50 lbs. to 500 gal. water). This treatment also removes any trace of chlorine left in the material. Rinse thoroughly, soften with a good softener, extract, and dry.

Operating Full-Fashioned Machines at Night

With reference to operating full-fashioned leggers at night, we have heard so many reports pro and con that it seems impossible for us to make up our minds whether to attempt it or not. Our main reason for trying to determine the possibility of running at night is because we only have room for 20 machines, and we do not want to make the mistake of putting in the wrong porportion of leggers and footers. (6021)

Mills in the Philadelphia district and quite a few plants in the South have operated the legging equipment during the night. From the standpoint of performance the operation has evidently been successful.

In this connection it may be well to point out, however, that careful supervision of the equipment is quite important. The machine must naturally be kept in good running condition so that the change from one operator to the other takes place without any disturbance. The mills we have had under observation in this respect are operated on an open shop or non-union basis. Whether it is possible for union shops to operate under similar conditions is a question which it is difficult to answer. It would have to be assumed that no restrictions are imposed or that the wage scale for the night shift is not disturbed. Generally speaking, it can be said that the operation of a night shift has been a success.

In regard to the space required for full-fashioned machines, you will find an excellent discussion of this sub-

ject in the article. "Full-fashioned Knitting Building," printed in the Feb. 5, 1927, Annual Review Number of TEXTILE WORLD.

Seams Break at Calender

We have been having some trouble with seams breaking, as you will note from the enclosed sample. The lawn being thinner than the thread itself, the calender rolls cut the thread at every stitch when going through these rolls. We have tried different types of thread but with no success, and we are wondering if you have any suggestions as to how we might overcome this trouble without pasting the seams. (6020)

We are inclined to believe that the chief cause of the thread breaking is the hard twisted yarn used, the size of the yarn, and the amount of tension on the stitch. From previous experience with this trouble on lawns and batistes, the writer would recommend the following:

The goods should be stitched in the gray room with No. 10, 3-ply combed peeler unbleached yarn. The lock stitch should be worked on the sewing machine with as little tension as possible to allow for contraction in the bleaching. We believe that if this idea is followed out, the seams will pass through the finishing plant without breaking at the calender.

Soaked or Unsoaked Silk for Weighted Flat Crepe

Will you kindly let us know if in weighted flat crepe it would be better to use unsoaked silk in warp? Will soaked silk show more streakiness in the warp than the unsoaked silk after dyeing? (6027)

If there is any difference between soaked and unsoaked silk in making a flat crepe for weighting the writer would be inclined to believe that it would be in favor of soaked silk. The fact that the thread had been softened would allow the warp to run better, and the less the warp is touched or handled, and the less a loom is stopped, the better will be the finished product. There seems to be no logical reason why soaking should eliminate any streakiness in the warp. This can only be overcome by the evenness of the stock itself, with extreme care in using good reeds, combined with perfect warping.

Stocking Frayed in Dyeing Machine

We are sending a ladies' stocking with a 50/2 mercerized cotton top which appears to be quite fuzzy on the outside of the welt. We also find the same thing on the heels and toes of some of them, but not as frequently. We find stockings this way when they are returned from the dyehouse. We have never noticed any before sending them there. Some lots will come back in perfect condition and in others there will be about 10% with fuzzy tops. I believe that this is done in the whizzing or from excessive boiling, but I do not know anything about dyeing, and any information you could give me on this would be greatly appreciated. You will notice that this fuzziness also appears on the outside of the plaiting in the foot. (6054)

The fuzziness complained of is due to fraying in the dyeing machine, caused usually by keeping the hose therein for too long a time. If the machine is not loaded to capacity, this fraying will also occur.

Rayon on Milanese Machine

We have been trying for some time to manufacture a milanese cloth made of 65 denier artificial silk. We have run into many difficulties and would like to have you advise us if there is any special information that can be given to assist us in running this yarn on a milanese machine. Our greatest difficulty is to get this yarn to work properly on the ends of the machine. On page 65 of your July 21, 1923, issue of TEXTILE WORLD, you had an article referring to artificial silk on milanese machines. We have studied this very carefully and have made use of the suggestions obtained therein. However, we have been unable to produce this cloth satisfactorily. Nearly four years have elapsed since this article was printed, and we believe that there may be additional information available that may assist us in making this cloth. Any information you can give us on this subject will be appreciated. (6052)

Rayon can be run successfully on milanese machines. Some mills are running it without much trouble, although it does not run quite as well as silk. It is necessary at the start to understand that a milanese machine equipped with any finer needles than regular 28 gauge will not work artificial silk satisfactorily until a much finer artificial silk is produced successfully. German-built milanese machines

contain needles that are much too fine for this purpose, some of them having needles which are really 36 gauge placed in a 28-gauge machine.

A regular 28-gauge needle will take 65 denier artificial silk easily if the machine is adjusted for the purpose. The sinker bar must depress the stitch at least 1/16 in. when sinker arch is going around the needle heads. The knock-over must be at least 3/64 in. deep. A quite flexible tension must be attached to the bobbin carriages to work on the threads in order to give flexibility to the material. Of course artificial silk is less flexible than boiled-off pure silk.

With reference to the selvages that are giving trouble, see that the right selvage has the blades on the T-bits fixed so that the bottom threads do not have to come up hill too suddenly in order to get on the top tier. Lift the bottom T-bit almost as high at the end as the top one, and set the beveled blade accordingly.

At the left selvage let the threads drop quite a distance to get on to the bottom tier. If the threads slacken too much lift the left blade a little.

If trouble occurs with the end needles in either selvage put in three coarser needles at each end and cut out the throat of the needle lead a little to make those two-end leads stand forward somewhat.

If the machine is an old one with stationary needle bar, slow down the speed to 50 motions per minute. If a good modern machine of reputable build is being used, a speed of 65 motions per minute will be the limit for artificial silk. An artificial silk that is being used successfully has 2½ turns of twist and is 60 and 65 denier.

Weaving Heavy Sley Goods

Is there any way of weaving cloth like sample in a smoother finish? We have tried every way possible including a light starching of warps, and it seems impossible to get the cloth smooth. With a heavy starching the results are as shown by the sample. (6013)

The roughness appears to be caused by the uneven distribution of the warp yarn in the shedding. This can be caused by the yarn being delivered to the loom beam from the section beams unevenly. When the tension is varied

on the section beams, the yarn enters the size box unevenly and is delivered to the drying cylinder unevenly. The size will not be distributed on the warp threads evenly and as this is a very heavy sheet of yarn, with little or no elasticity, the threads will cockle up slightly as they are delivered to the loom beam.

If the yarn is delivered direct from the loom beam to the harnesses, not using a whip roll, the cockled ends will not have a chance to adjust themselves before being delivered to the shed and they are woven into the cloth in this manner.

A single whip roll should never be used when the sheet of yarn is too heavy. When a single whip roll is used, the yarn will roll because there are too many ends in a given space to permit them to lie flat on the roll. It is not necessary to use any whip roll when the sheet of yarn is light.

The heavy sheet of yarn should be divided between two whip rolls, one of these whip rolls being located slightly above and behind the other. In this way, the warp will be under better control.

Very careful shedding is necessary when weaving a cloth of this kind, and the yarn comprising each sheet, or one-half the warp, should be adjusted so that each shed is as level and even as possible. For good weaving purposes, the warp should be well sized.

Skein Mercerized Yarn is Dry and Harsh

We are having considerable difficulty in determining what causes our mercerized yarn to have a dry, harsh finish. It drags and pulls hard off the cone at the knitting machines. We are sending full formula in detail of our system of mercerizing skein yarn. We are also sending you a sample cone of the yarn in question, and would appreciate any information you may furnish advising the cause of this harshness, as well as any recommendations as to how it may be overcome, and allow the yarn to pull free from the cone. Our system of mercerizing skein yarn is as follows:

Skein Mercerizing Formula

Two hundred pounds of skein yarn are strung on poles and put in a revolving Klauder-Weldon machine contain-

ing 700 gals. of chemically softened water, and boiled for 1¾ hrs. with

14 lbs. Soda Ash
10 lbs. Perborate Soda
2 lbs. Sulphonated Oil

After this the yarn is given one cold rinse for 10 min. It is then extracted, placed in a truck, and covered with wet burlap until mercerized. Some of this yarn will lie in this condition over night; also over Sunday before mercerizing.

Mercerizing—We use an 8-pole skein mercerizing machine. About 28 lbs. of yarn are distributed over this machine, stretched to gauge, lowered into a caustic bath of from 54 to 56 deg. Tw., and allowed to remain 3 min. The machine is then raised out of caustic; the yarn is allowed to drain 3 min., and is then rinsed (still under tension) for 6 min. in soft water, varying in temperature from 80 to 110 deg. F., after which the tension is released and the yarn is ready for souring.

Souring—The yarn is taken from the mercerizer on small sticks and placed in a tank containing 90 gals. of soft water (temperature 80 to 110 deg.) and 12 lbs. of muriatic acid, and allowed to lie dormant for from 3 to 4 min., after which it is transferred to another tank of clear water of 80 to 110 deg., and remains in this for the same time.

Finishing—After the yarn is taken from clear water it is strung on large poles and hung on a rack until the 200 lbs. are mercerized, which usually takes 2 hrs. Poles of yarn are then put on a revolving Klauder-Weldon machine containing 700 gals. of clear water at a temperature of 120 deg., and revolved for 20 min. It is then given two rinses of 5 min. each at a temperature of 110 deg., and finally given a 20 min. bath in 700 gals. of water containing 12 lbs. of ammonia and 8 lbs. of a softener. The yarn is then extracted, strung on a pole truck containing 200 lbs. of yarn, and put in the dryer at a temperature of 180 deg. F. for 2 hrs.

With the use of this formula we still have considerable trouble with harshness and the yarn clinging and pulling hard off the cone. Yarn is made from 1 3/16 in. strict middling cotton, and is wet twisted. (6025)

The writer has mercerized yarn in essentially the method described and has not experienced this particular difficulty. He has never tried wetting-out in just this way. It sounds like a reasonably mild treatment, and apparently the per-

borate is used to obtain a bleaching effect. Since bleached yarn sometimes feels more harsh than unbleached, this point might have a little attention as suggested later.

The souring might be criticized in that the yarn is not turned, and after lying in water that is more or less acid, is hung up for a couple of hours. This method no doubt has its advantages, but theoretically some of the acid might become partially dried into the outside portions of the yarn. If this actually happened, it would almost certainly injure the yarn enough to cause uneven dyeing, so unless such trouble is also experienced, this idea can probably be dismissed.

Sometimes a particular combination of souring and drying will cause a harsh scroopy effect, especially if soap has been applied at some previous time, or even in combination with a softener, many of which are partly soap. The nature of this particular softener is, of course, not known.

The drying temperature is high, and if the trouble is due to any one individual cause, this is most likely it.

It is best in case of such trouble to send through a few experiments, rather than depend too much on outside opinions. Follow the principle of changing just one thing at a time, then another, then perhaps both at once, and so on.

In this case take out a few skeins and let them dry in the air without heat. Then wind them and if they pull off better, cut the drying temperature down as far as possible and still maintain production. Incidentally, it might be well to moderately condition a few of the hot dried skeins by steaming, or very light sprinkling, rolling up in a cloth for a time to equalize the moisture and then wind and knit (not actually wet, of course).

Boil a few skeins separately from the lot, as in a small hand tub, with soda and oil alone, then let them come through with a lot and see if they come out any different, except of course, for color.

Also, although it may not sound so sensible, take a few skeins off a regular mercerized lot just before it goes into the softening bath, treat them separately with ammonia but no softener, put them with the regular lot to dry, and compare the results. If either of these very simple tests gives any definite indication, combinations of them can be

tried. It might also pay to try variations in the winding tension.

The result of the tests is likely to give a better answer than one can give from general experience.

Size for Cotton Drapery Warps

We run a slasher in the manufacture of draperies and would like a formula covering the sizing of warps. Can you give us a size formula for 16/1 and 18/1 carded, 30/2 and 50/2 combed peeler yarns? (6057)

In sizing yarn to be woven into draperies, the first thing that should be considered is how soft the warps can be made and still weave successfully, especially where rayon filling is used.

Not knowing the construction of these draperies, it is rather hard to prescribe a formula that would be just right. We would suggest that the inquirer start with a medium size; say about 70 lbs. starch, 10 lbs. dextrine, and 6 lbs. of tallow to 130 gals. of water. If this should be too heavy dilute with more water and boil. Then reduce the amount of solids on the next batch made. This formula we think will take care of the 16/1 and 18/1 yarn.

The 50/2 should run with a mixture of about one-half size and one-half water, made from the above mix. The 30/2 we think would weave without size, or with a very light size made by diluting the above mixture with more water. The softer feeling your draperies are the better the demand will be for them.

Ribbed Hose is Too Wide and Too Heavy

We are manufacturers of misses' rib hose and we are making the various sizes as follows:

Footers
2¼ in.—128 needles.
2½ in.—140 needles.
2¾ in.—152 needles.
3 in.—160 needles.
3¼ in.—176 needles.

Ribbers
3 in.—128 & 128 needles.
3¼ in.—140 & 140 needles.

3½ in.—152 & 152 needles.
3¾ in.—160 & 160 needles.
4 in.—176 & 176 needles.

All sizes go very well in the market except the largest one, which is made on 4-in.—176 & 176 needles, it being too wide and too heavy. We use 60/2 mercerized cotton yarn. Please tell us what can be done to correct this size, making the same lighter and narrower. (6059)

From the inquiry, it would seem that about the only choice is to use finer yarns for the size which is too wide and too heavy. Just what size to use will depend on how much lighter weight is desired. It might be well to try 70/2 and perhaps 80/2 American mercerized yarns in this case. These will require a little closer stitch and should give a slightly narrower tube for the leg, as well as lighter weight.

Oil Stains on Silk Filling

We have been supplying the throwster silk industry with various throwster tints for the last ten years. Occasionally we receive a complaint as represented by the enclosed swatch of crepe, especially so with the piece goods when dyed in a light tint. There seems to be a difference of opinion as to the cause of the stained silk. Can you enlighten us as to the probable cause? How can the stains or streaks be removed from the silk? Any information you can give us would be appreciated. (6061)

The sample submitted is a flat crepe and shows dirty filling which did not strip out in the boil-off, and looks very badly in light shades. This is more or less common throughout the industry, and it is our opinion that it is not due to the tint but is due to the fact that oil or grease got on spools before they were twisted into crepe. This dirt is so tightly twisted into the yarn that the boil-off solution and stripping cannot penetrate enough to boil it out.

As a rule, dirt or grease which gets on crepe yarn after throwing will strip out, but if the unthrown stock is dirty and is twisted after the dirt is on, it is almost impossible to get rid of it. We tried to remove these streaks with gasoline and a special softening but they would not come out. Then the thread itself was removed, without allow-

ing the twist to unravel, and it was still impossible to remove these dirt spots.

We then took the twist out of ten or twelve of these threads where the dirt appeared, and laid them carefully on a blotter. The first application of gasoline, once the twist was removed from the thread, immediately removed the dirt and transferred it to the blotter paper. This would indicate that the spots referred to are grease, dirt, or oil, and in no way the fault of the tint. If they were due to the tint they would not be soluble in gasoline. Attention should be paid to avoiding this trouble in the throwing.

A silk manufacturer replies to the question as follows: I am positive that the streaks are not from the tints but are due to grease on the silk which occurred perhaps in handling and will not come out in the boiling-off process. There is no doubt that these stains can be removed, but this is more difficult after goods have been dyed and weighted.

Use of Boil-Off Liquor in Dyeing

You recently published a reply to a question asking for certain information pertaining to boiling-off. There was mention of using the boil-off liquid in the dye bath. I have been asked to inquire from you just how this liquid is prepared and used in dyeing. Any information you can give me on the topic will be greatly appreciated. (6063)

The boil-off liquor is not prepared as such but is the liquor which remains after boiling-off gum silk with an olive oil soap solution. The olive oil soap solution is made by dissolving from 25 to 50% of olive oil soap, figured on the gum weight of the silk taken; the smaller amount for skein silk and the larger amount for piece goods. The silk is boiled for from one to three hours, and then lifted out, the olive oil soap solution remaining with the silk gum dissolved in it. This solution constitutes the boil-off liquor which is afterwards used in dyeing silk.

To make up a dye bath using boil-off liquor one must take into consideration the silk to be dyed. If it is pure dye silk skeins to be dyed with acid colors, a bath made up in the proportion of ¼ boil-off liquor and ¾ water will be satisfactory. If the silk is tin-weighted silk, the bath is

made up with ½ boil-off liquor and ½ water. If direct colors are to be used in dyeing, the bath can be made up with ⅛ boil-off liquor and ⅞ water.

In making up the bath for an acid dye liquor, the procedure is to fill up the dye box with ¼ or ½ boil-off liquor; then add enough sulphuric acid or acetic acid to make the liquor taste strongly sour. Then boil up this solution and continue boiling for a few minutes. Then shut off the steam and run in cold water to fill up the box. The steam may be turned on again to secure the proper temperature for the start of the dyeing operation. The use of boil-off liquor in the dye bath tends to promote more level dyeing of the silk.

Finishing White Flannel

I am anxious to find out the routine for finishing a white flannel men's wear, 13 or 14 ozs. I have had fairly good luck with them but I do not seem to get the soft soapy handle that the English mills get on such goods. Our fabric is the same, so we have decided it is in the finishing. Kindly send me a routine for such a fabric and any other information you may think it necessary for me to know.

(6065)

If the inquirer had stated the method he uses in finishing these goods we could probably have given him more complete information. We presume the inquirer refers to an all-wool fabric. The writer has handled these goods both abroad and in the United States and will give him the methods usually adopted in mills that put out a high-class fabric.

Great care must be taken that the fabric coming to the fulling mills is uniform in weight. That is, the dead loss from fulling and scouring should be at all times as near right as can be. The fuller must determine his shrinkage from the weight received, so as to give him a uniform finish, both in appearance and handle. An overfulled flannel does not have a full and attractive handle. The underfulled fabric has a hungry look and slazy handle that is not at all desirable. We will assume that the goods are coming right.

The British finisher fulls very much slower, as a rule, than his American cousin. His mills are kept open all the time. He weights his traps to get his length while he is

bringing in his width, consequently on a fabric like flannel he breaks it up more in the fulling mills, giving the nice deep cover that is wanted. In the washing or scouring after fulling, when he enters the goods, instead of washing out the fulling soap, he adds a little more soap solution. He uses a soap solution with a little more soda per gallon than is used in the fulling soap, allowing the goods to run from 20 to 30 min., according to the condition of the cloth. When ready to rinse off, he keeps his gates closed and floods his goods; then opening his gates and rinsing with warm water. This method does not require a second soaping in the washing process unless the goods are unusually dirty. Before the cloth is withdrawn from the washer the gates are closed and enough warm water is run in to thoroughly saturate the goods. Then they are given a solution of fuller's earth, one pailful to the cut, and run from 10 to 15 min. Then the goods are washed out with tepid water before taking the cuts from the washer. Just enough cold water should be run in to cool the goods down.

The fuller's earth solution is made by dissolving 8 oz. of the earth to the gallon of water, and thoroughly stirring before adding to the washer. Sometimes the practice of giving a slight steaming on the face after pressing is followed, but whether this is done or not, final judgment upon the finished goods should not be made until the goods are entirely cooled off from the pressing. Pressing one day and passing the next is a very good rule, and should be strictly carried out. It allows for the natural regain, conditions the goods, mellows the handle, and sets the finish. The modern cooling and conditioning machine is used by progressive mills to get the same effect immediately after the final finishing, and should be used on practically all classes of goods.

A finisher replies to this question as follows: First, have the goods properly burled. Then start them in the fulling mill with a good-bodied soap. A mild soap is best as too much alkali will make the goods harsh. Full in the grease and as quickly as possible. To get a softer feeling fabric scour the goods, then dry them, and then full with a neutral soap. In either case do not use too much alkali. After fulling, scour, dry, and finish in the regular way with shearing, steam brushing, and a light pressing.

Temperature for Drying Wool, Cotton, and Jute

We would appreciate any information you can give us on the following question: Which of the following three yarns is the more difficult to dry after sizing, and what is the ratio between the heat necessary to dry each: wool, cotton, jute? (6064)

We referred this question to Proctor & Schwartz, Inc., Philadelphia, who have made extensive studies of drying textiles, and they reply as follows: Sized wool yarn is easier to dry than cotton or jute. Cotton and jute yarns are about equal as far as drying is concerned. When drying sized wool yarn a temperature of 160 deg. is the average, whereas with cotton and jute 240 deg. is the average. Sized wool yarn will dry at 160 deg. in about the same time as cotton and jute yarns at 240 deg. Of course there are many variations which affect the results, as for instance the amount of size put on the yarn, the quality of the yarn, etc. But in a general way the relation is about as given above.

Section Marks on Cotton-Back Satins

Would too much weight in beaming a warp cause section marks in the cloth? Would not enough weight cause section marks in the cloth? Would too much weight on the looms cause section marks in the cloth? Would not enough weight on the looms cause section marks? My firm manufactures cotton-back satins, silk warp and cotton filling. (6062)

Too much weight in either the beaming or weaving could not possibly cause section marks. In work of this kind as much weight as the warp can reasonably bear should be applied in both the beaming and weaving, as all sorts of trouble can come from too little weight in beaming, which is liable to cause stickers and poor running warps. If the weight is so slack that the warp is flabby, section marks are liable to appear, but we have never known a warper of any experience to turn out a warp of this type.

In order to avoid section marks, we advise the inquirer to make sure he has the following conditions: carefully centered creel; even silk as to shade and size; free running rollers between cross-reed and mill; and carefully set sections so that they are not spaced or overlapped.

Another very important point is to be sure plenty of

papers are used, particularly on the beginning of a warp. They should be put in at very frequent intervals throughout the entire beaming process. This is one of the most important factors and neglect of it is the cause of a great many section marks.

Light Roping from One Side of Card

We are having some trouble with our finishing card that we cannot seem to locate. The clothing is sharp and the card is in very good condition, but one side runs the roping light while the other side runs heavy. The card is set the same on both sides except the rings, and they are set to the gauge on the light side and about ½-in. away from the cylinder on the side that runs heavy. When the feeder scales are set so as to give the right weight on the side that is running the light roping, the other side runs 20 grs. too heavy with the rings sitting as stated above. The roping seems to run on the spools in a funnel shape. That is, each end of roping gets smaller in diameter from the center of card over to the left-hand side facing the apron end of the card, and just the reverse from the center to the right-hand side of the card. We are carding cotton and wool on this card but the stock makes no difference as to the running. The roping runs the same regardless of the stock used. I notice that our carder has put a piece of fine wire clothing on the tumbler roller which extends about 2 ft. from the end of the roller. This is on the side that runs the roping light. But this does not seem to us to be the cause, for the trouble starts farther towards the center of the card.

(6058)

The trouble mentioned cannot be remedied by setting the feed scales or the ring doffer as stated in the question, as the settings mentioned only serve to make a bad condition worse. The stock in the feed scale should always be evenly balanced so the feed will be even on the feed apron in order to give an even weight drawing. Set the comb in the feeder so that both ends are the same distance from the pins to give an even weighing.

The ring doffer should not be set further off than the thickness of two gauges under any conditions. Set the doffer up to the same gauge from the cylinder on each end.

The trouble seems to lie in the Apperly feed. See that one side of the feed is not pulling in too fast. Set the adjust-

ments on the table to hold the feed back until it brings the light side up to the proper weight. Also have the feed table set even from end to end and hold the stock properly; also have the leader and tumbler sharp and set even and the proper distance from end to end. See that the fancy is set even and that it is clearing the cylinder properly and evenly.

Silk Broadcloth

Enclosed we are sending you a sample of broadcloth. Kindly give us a description of the silk used in this sample. (6076)

The sample submitted is about 2-in. square and therefore very difficult to analyze properly. Every test shows that the yarn in the cloth submitted is composed of 6 ends of 13/15 silk. Construction is as follows: 3 ends for each ply twisted 10 to 11 turns per inch and then doubled 35 turns in the opposite direction, making it a 2-ply 35 turns. Each ply consists of 3 ends of 13/15, 10 to 11 turns with the 2-ply twist opposite to the single ply twist. Both warp and filling are the same yarn.

Lime Stains on Cotton Cloth

The enclosed cutting of cotton cloth contains a pronounced yellow stain which we have been unable to remove or determine what has caused same. The goods were boiled in a high pressure kier with caustic soda and bleached using lime chemic. We would appreciate your advice on removing this stain and your opinion as to its cause. (6073)

The general appearance of the cotton cloth submitted indicated that the yellow stains are what are commonly called lime stains. Portions of the goods showing the stains were treated, therefore, with dilute hydrochloric acid (which removed the stain) and the resulting solution was tested for calcium. The analysis gave a distinct test for calcium, thus corroborating the opinion that the stains are lime stains.

These stains can be removed by treating the goods in a weak solution of muriatic acid at about 100° F. Following the sour the fabric should be thoroughly washed to remove all traces of acid.

It is probable that the stains had their origin in the bleaching process. When the lime boil is used, stains of this type are frequently encountered and even with the caustic boil similar stains are occasionally found when the goods leave the kier. It is more probable in this case that the stains come from the lime chemic.

The inquirer does not state what acid he uses in his white sour. Many bleachers use sulphuric acid and it is suggested, therefore, that the use of muriatic acid is preferable. Sulphuric acid, when used after the lime bleach, often causes the precipitation of calcium sulphate; while muriatic acid forms a soluble chloride of calcium which is more readily removed from the goods by the subsequent washing.

"Rights" and "Lefts" in Full-Fashioned Hosiery

Are there "rights" and "lefts" to full-fashioned hosiery? If so, are they knitted this way? (6068)

Full-fashioned knitters do not knit rights and lefts. However, some manufacturers do board their stockings as rights and lefts. They board some stockings with the seam on one side of the center back fold and others with the seam on the opposite side. When paired for retail, stockings are arranged so the seams do not show.

A full-fashioned hosiery mill superintendent to whom this question was put comments as follows:

The terms "right" and "left" probably refer to the way stockings are boarded and finished in pairs. One has the seam boarded inside or "up" so that when the stocking is laid flat the seam is "up" on the stocking and not on the edge. The other stocking is boarded with the seam "down," so that when the "down" is placed over the "up" neither of the seams can be seen. The familiar term is that they are boarded "ups and downs." Of course if the stockings were laid out flat with the toes toward each other they would resemble "rights" and "lefts," but they are not referred to in this way. In many cases when finishing an order which is being rushed out there are too many "ups" or "downs." These are placed in twos of either "up" or "down," in which case there would be two stockings alike. Except for placing the seam there is absolutely no differ-

ence in the way the stockings are made and after they are washed by the purchaser there will be no trace of any difference.

Fuzziness in Stockings

We are sending you two stockings, one in the gray and one finished. There is a pronounced fuzziness to these stockings and it has been causing considerable trouble. This fuzziness is more or less all over the silk boot. Changing needles and sinkers, careful inspection of the leads, and replacement of damaged ones, have not overcome this trouble. Would you be good enough to let us have your opinion of the cause of this. Possibly you may be able to suggest a remedy. (6074)

We have carefully examined the samples and find several nubby places, which are more or less common in certain grades of silk. We do not find any places such as would be likely to appear if there were trouble with the machines or with the handling of the goods after the boil-off. We have returned a swatch taken from one stocking which has one of the places referred to above, and suggest that you have the piece finished and then examined for the bunch centrally located. We fear the remedy is a different grade of silk.

Finishing Beaverteen

I am enclosing cutting of Beaverteen and would be greatly obliged if you would advise me what finishing is required after weaving to produce results similar to sample. What is the sequence of operations and formula for finishing ingredients, etc.? All information will be greatly appreciated. (6066)

This particular type of fabric should be taken from the weave room and sewed into continuous lengths by joining the piece ends on a sewing machine; then passed over a singer and treated with some diamalt product to assist in removing the sizing material. Goods should be allowed to lie in this condition for not less than 2½ or 3 hrs. From this point they should be taken and run over a 3-compartment open washing machine and dried over a cylinder drying machine. They are now ready for dyeing.

Dependent upon the requirements as to fastness and the cost per yard which can be allowed for dyeing, these goods should be dyed over a continuous sulphur dyeing range consisting of heavy 3-roll padder, oxidizing rigging, 6 to 8-compartment washer and cylinder dryer; or otherwise they should be dyed in what is known as mineral khaki. One type of mineral khaki range is very similar to the so-called sulphur dyeing range above mentioned. There is also another type of range consisting of two 3-roll padders, 30 to 40-cylinder dryer, ager that is 18 to 24 ft. long, and open soaping equipment. Following dyeing, the goods should be passed through a solution of some good softening oil and again dried.

From the appearance of the sample, the writer would judge that the goods had been given a heavy calendering, as the twill face is quite lustrous and has been flattened down to some extent, showing pressure through a 3-roll calender. After calendering, they should be taken to a 40 ft. tenter to even up the width and bring them to the fixed width desired. They would then be passed over a napping machine to give the napped effect as shown by the sample on the back. It may be necessary to give the goods another run over the tentering equipment to obtain even width. The finished fabrics are then ready for putting up. The sequence of operations and equipment all depend upon the yardage required in a given number of working hours.

Streaks Caused by Mixed Rayon

We are enclosing herewith a sample of rayon warp and cotton filling material showing faults in dyeing. The warp has been made from 150 denier "B" quality, 24 filament rayon. Will you kindly advise us whether these streaks are caused by faulty dyeing or whether they are caused by mixed rayon. (6071)

We have examined the three samples of dyed cotton-rayon material which show a streaky warp effect. These streaks are apparent on both sides of the swatches and are not similar to streaks due to faulty dyeing. One of the samples was completely stripped of color with sodium hypochlorite, then antichlored, and washed. While no faults could be observed in the white, upon redyeing the swatch

the streaks again appeared. This substantiates our opinion that the trouble is not due to faulty dyeing. Other constructions of cotton-rayon fabrics frequently exhibit similar faults which can be positively attributed to changes or mixtures in the rayon. There is apparently nothing that the dyer can do to overcome the uneven dyeings caused by mixed rayon.

Circular Felt Wicks

How can strips of felt wick be given a round or circular shape? We are cutting strips from a piece of felt and trying to convert these flat strips into the round shape, but are having trouble in getting a circular felt wick that is even in diameter. We want to know how we can get this even. (6072)

We assume that the inquirer refers to a wick such as used in boxes and bearings to convey oil from an oil chamber to a shaft. These are usually ⅛ to ⅜-inch in diameter and not very long. We do not know how these are made, but if we had to make them we should try a die—a hollow die of the correct internal diameter. This should be lined up with a hollow square tube, the inside of which should measure about 1/16-in. larger than the die. The strips of felt should be cut so as to fit into the square tube and be pushed through it by a square plunger or rod. If quantity production was required several sets of dies and tubes could be set up in a row and a power press used to force the plunger through.

Washer Wrinkles in Cloth

What are the real causes of washer streaks or wrinkles? Can they be taken out after the fabrics are finished? In my experience they occur more on twills, sheens, and serges from 8½ to 12 oz. fabrics. Some managers of sponging houses in New York claim they can be taken out by pressing with two damp cloths, one under and the other over the streak or wrinkle. Others claim that by decating they can remove wrinkles, while still others claim pressing or decating makes them show up more prominently. (6077)

Some fabrics are more likely than others to show washer streaks and wrinkles, due to construction, nature of the

stock, and the amount of twist in the yarn. All goods that are closely woven, or fabrics made up of hard spun yarns, have a tendency to show washer marks. If fulling is called for on such fabrics we have the possibility of mill wrinkles or, if piece dyed, the process of dyeing has to be contended with.

Before the cement roads were in such general use, drivers of automobiles were warned by the road authorities to keep out of the ruts. If each driver persisted in driving in the same ruts, in time they would get so prominent that driving would be dangerous. By each driver making his own rut, the surface of the road would have a uniformly broken surface, and no ruts would appear.

When cloth is being fulled, dyed, or washed, it must be so arranged during the processes that the second revolution eliminates the creases or wrinkles caused by the first one. Any mechanical means that will make the cloth change its position every revolution will have the effect of breaking up the twist of the yarns uniformly, so that a smooth finished fabric will result.

Sometimes a fabric is produced that seems to defy all the recognized means to prevent wrinkles that the finisher has at his command. Unusual measures have to be taken to get that everchanging action. Special pot-eyes or separators have to be attached to the washer, so that there will be no doubt about the frequency of the cloth changing its position. Tacking the goods is a great aid to whatever appliance is attached. Fabrics that are troublesome are often crabbed and very good results can be obtained this way. The crabbing takes place before washing.

Other fabrics are treated by running in a fulling mill dry, through a small throat. This helps to soften and break them up. We have seen excellent results obtained by this method. After pieces were dyed and dried, they were given 15 or 20 min. of dry fulling, then a slight steaming or spraying, and run on a roll for a few hours.

The finisher handling goods that are liable to crease or wrinkle has his work cut out by careful watching and a little ingenuity the wrinkles can be taken care of. A finisher would be sitting very uncomfortably if he shipped goods with wrinkles, and depended upon the sponger to remove

them. It takes more than damp cloths and pressing. We would much rather try decating.

A finisher sends the following reply to this question: Washer wrinkles have been caused by running in the washer with eyelet or mouthpiece that is too large, which lets the goods spread out before entering the large washer rolls. I get better results by having three sets of mouthpieces of different sizes for different weights of goods. They hold the goods in a rope and do not allow them to form wrinkles. I never had any luck in trying to get out wrinkles with pressing or decating.

I have found that the best way to get washer wrinkles out of 10 and 12 oz. serges is as follows: Put the goods in a fulling mill, soap them up with a neutral soap, run about 20 min. with all doors open to keep the cloth cool and prevent felting, then scour, crab, and let stay on the rolls over night. Dry and finish in the regular way. To handle twills and sheens, send them back to the washer, wet out, run through the crabbing machine, and let remain on the rolls over night. Then dry and finish.

Dark Ends in Pile Fabric

The sample of fabric that we are sending you is cut in four places. At each place along the filling is a dark end. The manufacturer claims this may be due to mixed yarn or coarse yarn. The warp ends were counted as near as they could be and two ends taken out. To be sure the correct ends were removed two from each side of the warp were also taken out and these are enclosed separately. This yarn has been dyed and shows no variation in color. Can you please explain what causes this dark end to run through the fabric? Please notice that the dark end runs through the fabric in even sections. (6069)

It would appear offhand that the finishing department is responsible for the dark lines in the sample of pile fabric. But the dark lines running so even in sections makes it impossible for an injured card or an injured ledger blade on a shearing machine to make them. After a careful examination of the sample we have come to the conclusion that one spool used to make the pile warp was of darker shade or heavier material than the others, so naturally shows in every section. If the defect was from finishing, the card

or shearing machine must have been injured every 11¼ in., which seems impossible unless it was done intentionally.

A pile fabric manufacturer replies to this question as follows: I received the sample of velour, and by a microscopic examination of the yarn I find that it is absolutely the same in diameter as well as in color. By going further into the fabric and brushing the opposite way of the nap, one can immediately bring out the dark streak that it contains. I therefore concluded that the yarn is satisfactory in every respect.

My point of view is that the streak is caused either in the ground warp at that place or in the reed. Whenever two ground warps, or one ground warp is tighter than the rest there is a tendency to pull the pile closer together, therefore not allowing the pile to open up in fan shape as readily as it would if the warp tension was the same.

The same defect can be caused by having the reeds bent over slightly, coming too close together, or having them at different angles from the rest, which would cause the warp to be slightly closer, which is very difficult to detect, but when the pile is cut will show streaks.

I am returning the sample to you and attached to it is a small tag. On receiving it try and break the pile at that point and you will see there is a greater space between the pile ends where the darker ends are running. I hope that my suggestion will assist your mill to overcome the difficulties.

Spots on Rayon Ribbon

I am sending six clippings of rayon-filled, piece-dyed unfinished ribbons in two colors. You will note these are spotted with what is supposed to be oil or grease. The writer has been unable to detect these spots after the goods are delivered from the loom, but finds them very easily after the goods are dyed. I would appreciate it very much if you would examine these clippings to determine the nature of these spots and suggest how they may be avoided. (6079)

The stains complained of are caused by lubricating oil. A careful survey of all machinery, overhead bearings, etc., will no doubt show you the source. Not only is it possible to get these stains in the weave shed, but also in the dye-

house. The extractor or the dye machines may be giving you the trouble, but the appearance of the stain indicates that the oil drips on to the ribbon from overhead bearings. It will be good policy to boil out your dye machines thoroughly to cleanse them of any accumulated grease that may become attached to the material.

Small Holes in Stocking

We enclose a sock in which you will notice there are several small holes, and we are at a loss to know what is causing them. This sock is made in the body of 300-denier rayon, lisle, and pure thread silk, and in the heel and toe of two strands 60/2 lisle. You will note the holes appear only in the rayon. (6088)

We need more information in order to answer the question intelligently, such as where the holes first show up, how the stockings are handled after knitting, how are they dyed, what materials are used, and in what form you buy them. It seems as though this must be a finishing defect, but we need more information. We find nothing to indicate the cause of the holes. The only suggestion we can make is that they are due to weakening of the rayon when wet, as in dyeing. It may be that some chemical is used which deposits at certain points and weakens the rayon more than the rest of the stocking.

Impregnated Webbing

We are enclosing a sample of webbing. We are interested in finding out the process by which this material is impregnated. Also can you tell us what it is? Any information you can give us on this subject will be appreciated. (6085)

The impregnating solution with which this material is treated is placed in a tank, in the bottom of which is a steam-pipe coil for the purpose of maintaining a temperature that will hold the compound in soluble form. The webbing is either run into baskets or wound on reels. It is then run over a roller at one end of the tank, down through the solution, under another roller at the bottom of the tank, and up again to the other end of the tank where it is run through a pair of squeeze rollers to remove

the excess compound. The webbing is usually dried in the open air or in a warm room. High temperature in drying is to be avoided as most of the impregnating compounds are of a highly inflammable nature. The tank may be a small affair, say 12 in. wide by 24 in. deep by 36 in. long.

If an eye or slot, made to conform quite closely to the dimensions of the webbing, is placed so that the material may be threaded through this eye just before it passes to the squeeze rolls, the latter will be relieved of much of their responsibility, and a much better result will be obtained.

It is a very difficult job for anyone except a chemist to determine exactly what this web was treated with. Chemical houses will be glad to help you on this point. It would be best, however, in order to determine the character of material used in impregnating the webbing, to submit samples to competent chemists for analysis. We might add that preliminary tests made by extracting the webbing with benzol show there is apparently a considerable amount of impregnating material present which has the appearance of asphalt, or a material of similar character.

Dyeing Rayon-Striped Brassiere Cloth

Enclosed you will find two clippings of a rayon-striped brassiere cloth. You will note the great difference in the dyeing of the cotton in these. The one showing the background nearly white is the correct cloth. The batches which these clippings represent were put through different kiers but dyed at the same time. Could you let us have any information as to why the cotton in one should absorb considerably more dye than the other? Cloths are both dyed in the rope, using 1% of acetic acid at 180°, with Rhodamine 6G extra. The lighter background is, as mentioned above, the correct finish which we are endeavoring to get, but for some reason or other we are very seldom able to obtain same. (6082)

We believe that the trouble as shown on these goods comes directly from faulty bleaching, although of course it is very difficult for one not actually in the plant to arrive at a definite conclusion. The sample of goods which is dyed more heavily and which is mentioned as being unsatisfactory is very cloudy. There are places, particularly on the back of the fabric, showing where the cotton portion of

the fabric is considerably darker in streaks than it is in other places.

We would recommend that the inquirer look to his kier boil to see that all air is expelled from the kier and that the boiling-off liquors are even in density before they are run on to the goods in the kier. Also pay close attention to the treatment of the goods in the bleach house after kier boiling. They should be well washed between kier boil, chlorine treatment, and antichlor treatment.

We would like to hear more about the exact methods used in bleaching this particular type of merchandise so that we could give more advice. If the inquirer is absolutely sure that the exact amount of dyestuff is used, and that identically the same temperatures have been used in the dyeing of these goods, the fault must be in the bleaching. We notice particularly that the goods which are satisfactory, from the standpoint of dyeing, are relatively more firm or wiry in finish than the sample which is unsatisfactory. This could revert back to the bleaching through improper treatment.

Putting Stain on Worsted—Roll Coverings—Beard on Yarn

I would like some information on how to put a brown stain on worsted and mohair yarn and get an even shade. Where is the proper place to put this stain on, at the gill box or at the drawing box? We are mixing mohair and worsted tops back of our can gill box (first operation) in the drawing room. We drop the stain on the ends as they go into the back rollers on this mixing box. When the work gets down on the roving the shade is quite uneven. When the yarn gets on to the dresser spool the shade is very uneven.

I would like some information on the proper way to ratch work for drawing and spinning machinery for long luster wool and blends of long wool and mohair. What kinds of roller covering are best suitable for spinning these long wools? Is chrome leather better than hard oak tan for luster and mohair? How can the beard be regulated? Has the quality of wool anything to do with one blend of yarn having less beard than another blend?

How warm should a spinning room be kept to get the best results on mohair and worsted? I will appreciate any

information you can give me on the subject of cut rollers in spinning, uneven shade, and too much beard on yarn. (6086)

The stain can be applied at the can gill by droppers, or at the 2-spindle gill box by dropping it on the end as it enters the flyer eye. It is almost impossible to get even shades throughout a lot. There are three necessary factors which help in the production of a uniform stain:

(1) The solution must be uniform in strength at all times.
(2) The quantity applied must be constant.
(3) Some method of batching or blending must be used to blend the product of the boxes where the stain is applied.

Perhaps you make the stain in small quantities. Make as large a quantity as possible. Sixty gallon tanks are used in many mills for this purpose. The water used to prepare the stains must not be hard. Read the chapter on "Water—Its Testing and Softening" in Howard Priestman's book, "Principles of Wool Combing," where full information regarding this important matter is given. We do not see any objection to unevenness when a stain is merely used as a safeguard to prevent mixes and mistakes in subsequent processes.

Opinions differ with regard to the ratching of wools and mohair in the drawing. Ratch is controlled by many factors, such as staple, quality, size of end, "condition" of wool, and amount of twist in the end. We set our ratches so that a "boardy" or too taut a condition does not exist between the back roll and top line of carriers. Sometimes we may have to allow ⅛ in. increase in ratch for each box, going back in the drawing room from the rover. At other times ¼ in. increase may be necessary.

Luster wools and mohair are very strong fibers and hard to draw, therefore no attempt to break the fibers in the drawing should be made. So long as the end is even, run your ratches as open as you possibly can. It preserves the length of staple and makes it easier for the top front roll to draft the stock. Always ratch to suit the longer staple whenever a blend is made and draft according to the shorter staple in the blend. We never attempt to break the staple for long wools except where the staple is poor. Breaking the longer fibers in a poor top enables a

shorter ratch setting to be used on the fine end of the drawing and in the spinning. The result is a more even yarn and a better spin. Experience has proved this many times. However, we only "break" as a last resort, and never advise doing it for luster wools or mohair.

Roll Coverings

The best roll to use for long wool and mohair is a soft-covered roll. This type of roll has a felt cover stretched over a wooden or iron boss. Over the felt the leather cover is placed and either tacked or laced according to the type of boss used. They give good service, but when once grooved or badly worn a new cover must be applied. When the resiliency of the felt disappears a new one is necessary or cockled yarn will soon appear. For hard covered rolls we prefer a double-covered chrome tanned leather. We having seen rubber-covered rolls that, after twelve months' continuous service were in good condition, and recently spinning frames were inspected where cork-covered rolls had run for eight months on carpet wools and wool and mohair blends, without showing any appreciable signs of wear.

Beard on Yarn

The "beard" present on yarn does depend upon the quality, staple, and blend of the wool or wools used. In addition, the system of spinning used and spindle speeds, also the "drag" used, affect the length of "beard." Flyer-spun yarn owes its smoothness to the low speeds used, not because the flyer is used. Ring-spun yarn is smoother than cap-spun or mule-spun yarn. If one blend has a higher percentage of coarser wool than another, other things being equal, it will have more beard. If the "drag" allows too much ballooning and yarn strikes separators excessively, more beard will result. If room is cold and humidity low, there will be rough yarn. A good temperature is 75° F. Use as high humidity as possible as long as it does not interfere with the spin; 55% to 60% gives good results. It is not enough to just have the room heated sufficiently; the working parts of the machines must also have the right

temperature. They should never feel cold to the touch. Ventilate the rooms scientifically; keep the windows closed.

If you are troubled with cut rollers in spinning, it may be due to one of the following causes:

(1) Short ratch.
(2) Carriers set too close to front roll.
(3) Too much twist in roving. (This means practically, short ratching.)
(4) Poor roll covers.
(5) Dry roll bearings.
(6) Not enough pressure.

Nos. 1 and 2 cause most of the cut rolls generally. Mohair often requires a ratch setting one to two inches longer than staple. So long as the yarn is satisfactory, set ratch as open as possible.

Silk Fabric is Harsh

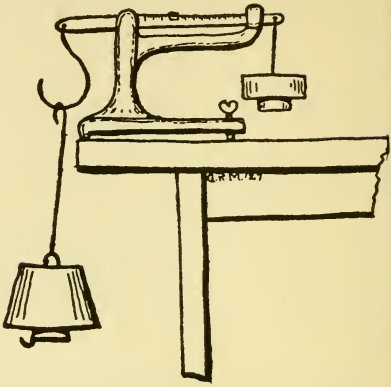
We enclose two samples of fabric, both of which have been knit from 12-thread tram, and in both instances the yarn was thrown by ourselves. You will notice that exhibit "A" is considerably softer than exhibit "B." As far as we know, the silk was treated in the same way during the throwing and knitting operations in both instances. We are at a loss to understand why one is ever so much softer than the other, and would very much appreciate any information you may give us on the matter. (6090)

Examination of these samples indicates that the machine for each used the same number of needles, although "B" is 4½ in. wide, and "A" is only 3 11/16 in. wide. The yarns have about the same turns per inch; 3.1 for "A" and 3.4 for "B." The stitches per foot of yarn are both about 96. These indicate that the fabrics are made from the same material.

It seems that "A," which is much softer, has less gum or has been treated with some oil to soften it. From the appearance of the raveled yarn, it seems very likely that the yarn in "A" has less gum than that in "B." A regular conditioning house test would be necessary to give the proper comparison.

Weight of Yarns in Hosiery

Please describe for us the most practical method of finding the weights of different counts of yarn in a dozen pair of hose. (6039)



Weighing Cones on Grain Scales

It is not clear whether the inquirer desires to find the weight of yarn as used in a knitting mill or as an analysis of some sample. If in the mill the most practical method of finding the weights of different yarns used in a dozen pairs of hose is as follows:

(1) Break each yarn on the machine near the cone and weigh each cone of yarn.

(2) Replace the cones, tie in the yarns, and pull the knots through the guides to get them out of the way.

(3) Knit a dozen pairs of stockings.

(4) Break each yarn at the cone again and reweight each cone of yarn.

(5) Deduct the second weight of each cone from the first and the result will be the actual weight of yarn used from that cone. The weights of similar yarns can be added to get the totals of each kind of yarn.

Note.—If trouble occurs during knitting these 24 stockings, and time does not permit repeating the test, care should be taken to knit all of every stocking, even if one is represented by two or three pieces. If any cone of yarn is exhausted during the test, weigh the old cone when removed, and the new cone before starting it, and at the end of the test.

The total weight of yarn used should be checked against the average weight of several dozen pairs, just off the knitting machine. Accurate scales should be used. Grain scales can often be used if placed at a bench edge and

equipped with a long hook to go through the cone. If used in both weighings, the weight of the hook can be disregarded.

If the stockings made are half hose, the quality of yarns used on the ribbers can be found in this same way and will include the weight of yarn used in the transferring courses.

WEIGTH OF YARN IN ONE DOZEN PAIRS OF HOSE

Yarns	Part knit	Weight start	Weight finish	Net weight used
100/2.....	Toe.....	566.0	152.4	413.6
50/2.....	Toe.....	2,642.8	1,782.0	860.8
50/2.....	Sole.....	1,575.3	927.3	648.0
120 den.....	Foot.....	986.9	672.5	314.4
120 den.....	Leg.....	3,911.5	429.1	3,482.4
100/2.....	Reinforce.....	669.2	513.2	156.0
50/2.....	Heel.....	586.5	276.9	309.6
100/2.....	Heel.....	1,058.9	931.7	127.2
50/2.....	Top.....	407.9	*162.3	245.6
	New cone.....	7,956.9	2,860.1	5,096.8

* Weight of empty cone.

SUMMARY

100/2.....	696.8 grs. or	.0995	lbs.
50/2.....	7,160.8 grs. or	1.0230	lbs.
120 den.....	3,796.8 grs. or	.5424	lbs.
Total.....	11,654.4 grs. or	1.6649	lbs.

To find the weights of different yarns by analyzing the stockings, it is necessary to cut the looping and ravel any seams of one stocking. Then the yarns must be raveled and separated into the various sizes, which means that each yarn must be measured and weighed to determine its size as well as weight.

In seamless hosiery, it is necessary to estimate the weight of the cut out reinforcing yarns and the cut off looper's courses. It is practical to analyze but one stocking because of the time required, and that one should be carefully selected as representing average weight and dimensions.

Uneven Worsted Yarn in Infant's Stocking

I enclose herewith one infant's stocking made of two threads of 1/45 pure worsted. Upon examining this stocking you will note the fabric is very uneven. We have tried everything we can think of to overcome this trouble, but have not succeeded. We would like to know if you have any suggestions with regard to this matter. (6091)

We have examined this ribbed leg child's stocking closely and noted its uneven texture. We particularly raveled yarns from the leg where the two ends of single 45s worsted were used and find this yarn is very uneven. In some places the light and heavy spots come together, giving a fairly normal condition, but in other places two thin spots may come together and make a decided horizontal streak in the stocking. Both yarns seem to be the same and we would suggest close examination of the original yarn from which these are knitted as a means of proving conclusively that the yarn is uneven. There is nothing faulty in the knitting of this sample.

Bar Effect in Rayon Knit Fabric

We are enclosing herewith a sample of our fabric showing a barred design. You will note that where we have marked it, this barring does not show up. We are at a loss to understand what causes this effect. We are having trouble from it and wonder why it should just show up at intervals. If you can give us any information concerning this we shall be greatly obliged. (6092)

This is an old trouble with rayon underwear fabric knit on multiple feed machines. The "bar" is actually caused by having the rayon at one feed a different shade than at the others. By raveling the fabric and keeping the yarn from the "bar" separate, it is possible to show that it is lighter in color than the rest. In this case, the stitch at each feed is as near the same as can be expected, and all the yarns have 21 filaments.

This trouble is probably due to one end being from a different solution in the manufacture of the rayon than the others. It will have a slightly different absorptive power for the dyestuff and so will not be the same shade. You should be careful not to mix rayon lots.

Broken Picks in Rayon Weaving

In running rayon filling in 34-in. cloth on a 44-in. loom we are having a lot of broken picks. We are lining the shuttles with fur. Any information that would help us to overcome this fault would be greatly appreciated. We have got everything as smooth as we can. The broken pick does not occur when the bobbin changes; it is when the bobbin is down about half way. (6097)

The rayon of today is a good strong thread, so we will assume that the fault does not lie with the filling. If the yarn were broken through excessive ballooning, the broken end of the filling would be drawn through the top or bottom of the shuttle and the loom would stop.

We think that the trouble is caused by the use of the wrong type of filling bobbin. If the end of the bobbin is not shaped right, the unwinding yarn will snarl up on it, causing the filling to break. This filling break usually occurs when the bobbin is half exposed. The yarn breaks with the end still in the eye and a considerable length of filling extending beyond the eye. This trailing end is just long enough to be caught by the closing shed, which permits it to tip the filling fork and prevents the loom from stopping. After the filling has broken the snarl often untangles through the vibration of the loom, which will continue to run until the filling becomes snarled up again. When the filling breaks in this manner it is possible to miss from one-half to one and one-half picks of filling, depending on the side of the loom which the shuttle is leaving when the filling becomes snarled and broken. Many shapes of filling bobbin are now being used to prevent this trouble.

Loops Distorted in Silk Stocking

I am sending you a stocking made of 8-thread tram and 50/2 cotton, on a 240-latch needle, 3½ in. cylinder machine. The stocking has a great quantity of ridges in the boot. The length of the boot is supposed to measure 23 to 23½ in., which you will see is very near right. We have a considerable amount of the stockings already dyed and boarded, and also some in the gum, and would appreciate it very much if you could give us some advice as to the best way of overcoming this defect, such as sizing or re-

boarding the stockings already made. Also what could be the cause of this trouble? Is it too loose or slazy? Is it practical to use a machine of the above type to make an 8-thread stocking? (6108)

As far as we can determine, this trouble, which is very common, is due mostly to using what is really too fine a yarn for the needle spacing of the machine. The trouble comes in circular-knit and full-fashioned hosiery, with rayon and with real silk.

Probably the natural stiffness of the silk has something to do with the distortion of the loops, which is the basis of this trouble. We have sometimes eliminated some of this trouble by reboarding carefully. Make sure that the stockings are uniformly wet before boarding, and put them on the boards before they dry out any. It may be that some trouble will result from having the stocking too dry before boarding.

The only thing we can suggest for preventing this trouble is having the yarn as uniformly conditioned as possible, and when oil is used to have it applied uniformly. In any case, the yarn should not stand around long between winding and oiling, and knitting.

Looper for Full-Fashioned Stocking

Can you advise me what point looper would be best suited for a good service weight full-fashioned, 39-gauge stocking; also 42 gauge? (6087)

Twenty point for 39 gauge; 22 point for 42 gauge.

Bleached Yarns Dye Unevenly

Occasionally we have orders to dye into fancy colors yarn that has been previously sulphur bleached, and in some cases yarn that has been through both the peroxide and sulphur bleaching processes. We always experience considerable difficulty in dyeing these yarns even. Will you kindly advise if there is any treatment that you know of that we can give this yarn previous to dyeing so that same will dye satisfactorily. (6105)

Wool yarn that has been properly bleached and thoroughly washed after bleaching should dye evenly. If bleaching has been done unevenly, it is an impossibility to

dye even shades on the yarn. This is the first point to investigate. If the yarn is not thoroughly washed after bleaching, some of the bleaching reagent may be left in the material and the dyestuff will either go on the yarn unevenly or will be decolorized in the portions where the bleaching medium remains on the yarn. Sulphur-bleached yarn is the worst offender in this respect, for it is particularly difficult to wash out the last traces of the sulphur dioxide. It is sometimes necessary to wash in a weak oxidizing bath, such as hydrogen peroxide. If this is done, there should be very little possibility of unevenness after dyeing, at least unevenness due to bleaching residues.

Bleached yarn should be wet out evenly and carefully before being entered into the dyebath, so that some portions of the yarn will not take up the dyestuff faster than other portions. The acid used to exhaust the dye bath should be added carefully and in small quantities to prevent a too rapid rushing on of the color.

It would perhaps be well for you to make test dyeings of yarn to determine a remedy for the unevenness. You might give samples of the yarn a treatment in a weak solution of hydrogen peroxide, sodium hypochlorite, or potassium permanganate, then wash thoroughly, and dye as usual. If this is not productive of even results, either the bleach itself is uneven or the trouble lies in the dye bath.

The writer presumes that either acid or mordant acid colors are being used in dyeing, and that some acid is used to exhaust the bath. It is generally advisable to start the bath with acetic acid, and to exhaust, after boiling for some time, with a little sulphuric acid.

Weaving Duck and Tire Fabric

I am looking for information as to weaving of heavy cotton ducks or tire fabric, and anything in the line of heavy cotton fabrics. I want to know the size of shed, number of harnesses used, the position of whip roll, bow boards used, etc. (6100)

The size of the shed would, of course, depend largely upon the size of the shuttle and varies a good deal with the weight of the duck or fabric being woven. There are generally two harnesses. When there are a great number

of ends per inch four harnesses are used, two shades on the front harness and two shades on the back harness. The position of the whip roll is usually 3 to 4 inches higher than the breast beam. This depends on the duck being woven and how well the filling is beating up.

Bow boards have to be used on tire fabric to prevent the curving of the filling. On 72 in. tire fabric, the bow board would probably be 2 in. more in the center than it would be at the selvages. Too much curve to the board has to be avoided or you will get extra curves in the filling near the selvages.

Finishing Rayon Underwear

Would you kindly tell me how mills finish men's athletic shirts and athletic union suits of rayon, knit on 28-cut and 34-cut spring needle machine. I refer to finishing the goods in the sewing room. What machines are used in the finishing room on these gauges? What threads are used and stitches per inch? (6103)

This texture of knitting may mean an expensive garment or it may mean a cheap one, depending upon the denier of the yarns used. If the inquirer desires to make a cheap garment at a low price, cheap methods must be followed in manufacturing it. Generally speaking, a seamer, hemmer, two-line facer, button stay, twin needle and straight-line lock-stitch machines might be sufficient. The size of threads and numbers of stitches to the inch cannot be determined without taking into consideration the grade of garment being made. The inquiry should be more specific and samples of the goods submitted to enable an intelligent answer to be given.

Worsted Roving Differs in Shade

I would be glad if you could give us your opinion on the enclosed samples. On running 15,000 lbs. through drawing the rovings come up in different shades; 75% approximately are of the light shade and 25% are dark. Unfortunately before we found it out the tops were all through. As this stock did not follow colored, we are at a loss to understand the reason for this. We had no trouble whatever with a white lot which was run through previous to this, and have had no trouble with lots that have followed.

The tops which went into this lot were, according to the comber's memo., of the same lot. All we know regarding that end of it is that we had four shipments, all purporting to be the same lot. Would faulty scouring or combing account for it? Are they the same grade? (6102)

The dark and light shades are from two distinct lots of top. There is no difference in the quality or maximum staple, but we found the "light" shade to be the better of the two after stapling and analyzing the roving. We believe that the comber has made a mistake and probably sent you one shipment from another lot. There is such a marked difference in shade that we cannot understand why it was not discovered before it was made into roving.

If the scouring were faulty on this lot, the whole lot would have been the same, due to the doublings and blending between the card and the finished top. If mixed in the finishers, some tops would have been streaky due to mixture of light and dark shades, with the result that many shades of roving would be obtained with your method of handling top.

We gave both samples a thorough scouring and after the test the samples differed in shade as much as they did before scouring.

Difference in Length of Stockings

I am sending two stockings in the gray which are made up of 3-end, 13/15 Japan silk, plated over 150 denier rayon, and would appreciate advice as to what causes the difference in length in these two stockings. Is it due to the silk, the treatment of the silk, the rayon, or is it in the knitting? You may cut or unravel these stockings if desired. (6107)

An analysis of these stockings shows the following courses per inch:

	Long Hose	Short Hose
Welt	34	39
Upper leg	45	51
Ankle	52	52

On the basis that each stocking has the same total courses, the above figures would explain the difference in

length. Where there are fewer courses per inch the same number of courses makes a longer piece of fabric. In this case the ankle stitch is the same, and presumably satisfactory, which indicates that the ankle adjustment is correct. The upper leg stitch differs in the two stockings, probably due to a slight difference in the cams at the pattern drum. The difference between these two stockings does not seem very serious, as it is not unusual to have even greater differences than this in the finished stockings.

Finishing Linen Toweling

Can you tell us how linen toweling like sample is finished? It is our own goods but is finished in an outside bleachery. My bleacher says he does not know how it is done. I am referring to the backfilling. How is it done and what is used to get the results? (6104)

For the backfilling of the linen toweling it would seem to us as though a mixture has been used containing about 50 lbs. of pearl corn starch, 20 lbs. of tapioca flour, 25 to 30 lbs. of talc, and 20 lbs. of white tallow softener to 100 gals. of starch. This filling should be applied on an ordinary blackfilling mangle or Tommy Dodd, after which the goods should be dried, allowed to cool, then slightly conditioned, and finished on a calender with the heated metal rolls striking the unfilled side of the goods to bring up the luster as much as possible. This backfilled sample has been subjected to good pressure on a calender.

Applying Mill Burden

The writer is affiliated with a weaving plant manufacturing a wide range of products, from very cheap, low-grade articles to high-grade, expensive ones. The products do not range widely apart in point of labor cost in manufacture; their chief difference being in the material value. In determining the mill cost of these articles by applying mill burden through the medium of the loom day rate (productive capacity of the article being the basis of its burden charge), and by straight percentage of the material and labor cost (this latter method admittedly unscientific), widely different cost figures are obtained.

To illustrate the point I quote you below figures to show extreme cases, using assumed figures for ease in handling:

No. 1

	(A)	(B)
Mat. Value	40.0c per yd.	40.0c per yd.
Labor	25.0	25.0
M and L	65.0c per yd.	65.0c per yd.
Burden	10.0	9.75
	75.0c per yd.	74.75c per yd.

(A) has producing capacity of 15 yds. per day, which with a loom day rate of $1.50 per day is equal to 10c per yard. (B) is figured by assuming a mill burden of 15% of total material and labor value.

No. 2

	(A)	(B)
Mat. Value	140.0c per yd.	140.0c per yd.
Labor	25.0	25.0
M and L	165.0c per yd.	165.0c per yd.
Burden	6.0	24.75
	171.0c per yd.	189.75c per yd.

Producing capacity 25 yards per day. Other conditions as above.

"X" contends that even though there is no difference in the labor cost of the two articles, and in spite of the fact that the more expensive article (by virtue of its material value) is a much faster producer when on the loom, that it is correct to figure the mill burden on the basis of loom production alone. He contends that an article which is so much more expensive than the lower grades should have included in the mill cost an additional charge to take care of risk, and that such additional charge added to the expensive articles should be passed back to the benefit of the cheaper grades, which by virtue of keener competition should be favored against higher-priced articles. He claims that in a case like the one cited, application of a straight percentage based on total material and labor cost (while unscientific) does more nearly express the relative value, and as a basis for determining selling prices is far better than the production method.

"Y" contends that the risk factor in manufacturing is a non-existent factor; that two articles made at the same time, whose point of difference is in value of the material only, must be burdened in relation to producing capacity, as it makes no difference in manufacturing operations whether

the material be of the lowest or highest grade, nor whether the articles be cheap or expensive. "Y" contends that producing capacity, which also is a determining factor in the labor charge, is the only correct basis; that the so-called risk is in intangible element which has no place in manufacturing costs, which deal with concrete facts. Risk is the judgment of someone on market possibilities, losses through poors and seconds, changes of style, etc., and should be expressed in the margin of profit demanded above the mill cost (based on productive capacity) when setting the selling price.

Undoubtedly other mills have a similar problem, and the writer would like to have an expression of opinion on the two methods of figuring. (6118)

It would seem that the reasoning of "X" tends to make an already cheap article somewhat cheaper, but at the expense of an expensive article. If this line of thought was adhered to under all conditions, it might be possible for use as a cost finding system. One cannot help but wonder, however, if the competition in the fine goods market is not sufficiently keen as to cause search for some reason for costing the fine goods on a production basis lower than real facts would justify, but which would allow an apparent profit at a given sales price. When the final accounting was made, the charge would have to go somewhere, and if not allocated to a particular product, then the general mill overhead has to absorb it and in turn push the price, or rather cost, of all products up.

"Y" contends that the risk factor in manufacturing is nonexistent. Maybe, but it is just as well to put in a little, just for luck. "Y" is correct in saying that it is intangible as regards market possibilities, style changes, etc., and such things must be the function of the merchandizing man in establishing a gross profit high enough to care for eventualities, provided there are that kind of merchandizing men, and they can get the price they want.

But we shall have to disagree as to poors and seconds. That is a manufacturing cost which can be fairly well estimated on past experience. It is certain that 100% perfects cannot be expected and every mill knows, or should know, what to expect from a given type of merchandise. The proper place for this charge is in the overhead and spread out over the entire production of the mill.

It would seem obvious that a faster running merchandise

would bear a lower overhead based on direct labor. Let us assume that a high-grade cloth was fabricated 25% faster with the same equipment than a low-grade cloth. From the production standpoint, the high-grade cloth is the better proposition, as less direct labor is required, and more dollars of value are produced in a given time with a constant expenditure for all fixed charge items in the overhead and only little excess because of the variables included. The net result is less overhead applied to the high-grade cloth because of its faster running qualities.

The application of a percentage to material and labor as burden is not an obvious method, and would seem to lead to various discrepancies in cost finding. The usual method is to determine cost of materials, labor, and overhead, the latter being a percentage on the direct labor involved without reference to material. If desired, this can be broken down departmentally, but a single figure should exist for the general mill overhead as applied to all its direct labor, and in this general mill overhead should be some allowance for seconds.

A cost system, if it ignores what actually happens in a mill, and sets its costs on theoretically perfect production, may be useful as a means of checking efficiency of operation, but as a means of setting sales prices it is a fizzle.

To go back to "X's" contention, it is all right to figure his sale price lower on the cheap goods if he wants to, provided such reduction is added to the sales price of the higher class goods. "X" should be sure that the high-class goods are going to be sold in a quantity sufficient to absorb the overhead charges thus arbitrarily transferred. It is sometimes hard to eat the cake and have it too. "Y's" contention is well taken, but seems to ignore the advantage of a better running stock. An overhead based on direct labor would correct the difficulties of both.

Labor Cost in South on Coarse Yarns

We would like to know what is considered a fair labor cost in the South for mills manufacturing coarse yarns from 2s to 8s, about 50% of the production being 8s, 40% being 5s and 6s, and 10% being 2s. We would also thank you to advise us the difference in winding one and two-end yarn on Universal winders; what per cent increase should be gained in winding two-end over one-end? (6110)

The following tabulation will indicate an approximate southern labor cost on the yarns referred to:

	2 s	5 s	6 s	8 s
Card room labor per lb.	$.0070	$.0095	$.0095	$.0150
Spinning room labor per lb.	.0025	.0056	.0065	.0085
*Winding labor per lb.	.0044	.0059	.0061	.0068
Packing labor per lb.	.0020	.0020	.0020	.0020
Total cost per lb.	$.0159	$.0230	$.0241	$.0323

*Cones or tubes.

As regards the relative production on single-end and two-end winding, the production on two-end would be nearly double the production on single-end except for the extra doffing involved and possibly a slightly lower speed in the two-end winding. Taking these into account, a fair guess would be that on two-end the production would be 60% to 80% greater per spindle than on single-end.

Breaks in Heels of Stockings Knit from Mercerized Yarn Dyed Sulphur Black

We are enclosing several unfinished hosiery in which our customer has used 45/2 mercerized sulphur black. You will note that the heel is broken in various places, and our customer advises us that the yarn is burned. We have made several tests of this yarn, all of it breaking from 130 to 135 lb. average. This yarn is considered among the best on the market. We have had several of these cones knitted for different purposes and the results were very satisfactory. Could you determine and explain to us what caused these rips? We are at a loss to understand the cause of this. Do you think it is the adjustment of the machines? We are enclosing a sample reeling of the yarn. If you cannot explain this problem to us, will you kindly advise us to whom to write. (6109)

It seems that one of these split foot stockings shows the breaks and runs much worse than the other. On examination, the latter shows about 53 courses per inch while the former has about 43 courses per inch. This indicates that the stitch was too tight on the foot having the greater

number of courses. The breaks on the other stocking are at the gores, and it is to be expected that some stockings will show these holes. It is possible that the knitting machine is putting too much tension on the yarn, which might easily cause this trouble. We do not consider this yarn too weak.

Finishing Rayon Webbing

We are makers of all types of elastic webbing, and have difficulty in procuring luster in the finishing of artificial silk webbing. The webbing looks perfectly satisfactory after weaving, but the finishing bath seems to take a great deal of the shine from the silk and leaves it dead. It is much poorer than some of our competitors' lines.

We finish all our silk webs by immersing them in the finishing bath, which is made up of gum arabic and water. We have tried at various times to finish these webs only on the back, but have never had much luck with that, due to the fact that we seem to get a very uneven finish and a great deal of web came off the calender curly. We are wondering if you could give us any hint of our troubles and advise us of any size preparation that we should use.

One other point that we wish to bring up is that our competitors' web after finishing is very much softer to the feel, and has a much silkier feel on the face than we are able to obtain. We have, after finishing our webs, quite a harsh feeling to the face. Anything you can advise will be very much appreciated. (6114)

Gum arabic is very apt to detract from the natural luster of artificial silk in much the same way as paraffin. Ordinarily no difficulty ought to be experienced in finishing webs on one side only if the rolls in the machine are in proper condition. Artificial silks, however, are probably best finished on both sides, particularly elastics, as most of these webs are reversible.

The following are two very good mixtures for artificial silk elastic webs:

(A) 1 to 2 lbs. soluble potato starch.
1 to 2 qts. glucose.
5 gals. water.

(B) ½ lb. gelatine.
12 qts. water.

If a still softer effect is desired, try a finishing bath using Bordeaux size.

Any of the foregoing baths will produce a very good effect and leave the goods soft and silky, even more so than before finishing. It may be superfluous to add that once the rayon is started through the finishing machine, the machine should not be stopped for more than a few minutes at a time. Either cut out or run out the goods at both noon and night.

Treating Embossed Effect to Resist Steaming

We are submitting a sample of fabric which is embossed by the brass plate method, not by rollers. We would like to know of some size or other treatment which we can use on this fabric to make the effect permanent to steaming. (6106)

There is no simple solution or treatment that we know of which you can use to make the embossed effect permanent to heat and moisture. You will probably have to coat the fabric back and front with a waterproof finishing material which will not spoil the handle of the fabric. Experimental work will be necessary to determine suitable materials and processes to use, and we would suggest that the problem be placed before makers of finishing materials or one of the consulting laboratories.

Himalaya Yarn

We have an inquiry for a yarn to be spun with varying thick and thin places. This is not slub yarn, as we are accustomed to making slub yarn in various kinds of novelty yarns on the twister. This yarn seems to be a single yarn and the thin place would be approximately a 30s yarn, gradually increasing in size up to a 4s yarn, and then decreasing again very gradually to a 30s yarn. These increases and decreases do not occur at regular intervals unless the repeat is a very long one. The length of these increases and decreases seems to vary also. If you can give us information as to how to manufacture this yarn, we will appreciate it very much indeed. (6122)

A yarn of this description is known to the trade as Himalaya yarn. It is made on both roving and spinning ma-

chinery by speeding up and slowing down the back roll. Another method of producing the yarn would be to burn a groove in the leather top roll; as the material traverses back and forth it runs under the groove, which makes the larger yarn at varying intervals. This yarn was quite a fad about two years ago, and machinery builders brought out frame attachments for making it. They will be glad to give particulars of these devices.

Capacity of Can Dryer

We would esteem it a favor if you would kindly advise us what production you figure can be got off an 18 can, 23-in. diameter steam can dryer, being operated at 15 lbs. steam pressure. We believe there is some formula to ascertain this production, which takes into consideration the weight of the cloth and the amount of moisture it contains. For your information we might say that we pad these goods directly before going on the dryer, and we figure the goods to contain 50% moisture. (6111)

An 18-cylinder dryer with 15 lbs. steam pressure should give 36 yds. per minute on goods weighing five yards per pound. This assumes that the goods do not contain more than 60% of their weight of water. Fabrics which have been kier-boiled and bleached will oftentimes carry a great deal more moisture than 60%, unless the rolls in the padder or water mangle are in first-class condition and give a clean cushion nip. For a dryer to work on the above basis, the condensation must be gotten cleanly away from the exhaust side of the cylinders, and the dryer should be properly equipped with efficient traps to keep the cylinders clear of condensation.

The writer is very familiar with one particular dryer running in New England at the present time on goods weighing about seven yards per pound. The range consists of a scutcher, a 3-roll water mangle, and 39-cylinder dryer. On goods weighing seven to seven and one-half yards per pound, this dryer operates at 110 yds. per minute.

We believe that this should give the inquirer the information he is looking for. We recommend, however, that in making tests no assumption of the amount of moisture should be allowed to bear influence on the tests. The goods

should be actually weighed in the wet condition and when dry, in order to get the percentage of moisture.

Resist Stains on Cotton Fabrics

We are sending a swatch of light-weight cloth which has been bleached and dyed in the piece, but has not yet been napped. You will notice the various places where the dye has not taken. We are bothered continually with these "resist spots" and are anxious to eliminate them. The warp in this cloth is lightly sized and so it is not desized before bleaching, but simply boiled-out in hot water before passing into the kier. The mill uses simply a caustic boil—no oil—and a chlorine bleach. The goods are then dried on cans and dyed on a continuous machine. The water has some alum in it, but not much. Please send us any information you can on this problem as soon as possible. (6126)

Resist stains on cotton fabrics may be due to any one of several causes. The origin of these stains on any particular lot of cloth is, therefore, difficult to determine. This is especially true when one does not have detailed information as to the various processes to which the cloth has been subjected.

Some of the more common causes of resists are insufficient kier boiling, faulty bleaching, use of hard water, and lack of proper washing after chemicking or souring. Overbleaching with the formation of oxycellulose, is also liable to cause resists. In fact, foreign matter of any description which is present in the cloth at the time of dyeing may result in these stains. This is most evident in the case of goods which are to be pad dyed or processed on the continuous machine where the length of time that the goods remain in contact with the dye liquor is comparatively short.

An examination of the sample submitted showed it to be free of oxycellulose, lime, and other minerals which are known to form resists. After stripping the color from the fabric and redyeing no resist was observed; this indicates that the goods had been properly boiled. Our conclusions are that in this case the methods of kier boiling and bleaching are not at fault and that the resist is probably due to insufficient washing after bleaching.

To prevent the reoccurrence of these stains, it is sug-

gested that particular attention be given to the final washing after bleaching. If the resist still appears after this precaution is taken, it may be found necessary to soap the goods after bleaching. Soaping may be done either in rope form or at full width, depending upon the type of equipment which is available. It is important that the soap be thoroughly rinsed from the fabric as traces of soap dried into the fabric may of itself cause resists. In some bleacheries the use of pine oil emulsion has been found effective in combating this type of stain. In our opinion, this method is preferable to soaping. In this method the goods after bleaching and washing are passed through a boiling solution containing about 1 gal. of pine oil emulsion to each 100 gals. of water; the goods are then dried without further washing and are ready for dyeing.

Rayon Flock

We enclose samples of rayon flock. No. 1 is a sample of imported rayon flock which is satisfactory for our requirements. No. 2 is a type of our own domestic rayon flock and is not satisfactory in every respect. You will note that our flock kind of sticks together and we have gone to considerable expense and time trying to remedy this defect. We would like to have your opinion as to what causes it to stick, and if possible to advise us what the difference is between type No. 1, which is satisfactory, and type No. 2, which is unsatisfactory. Would the fact that type No. 1 is dyed make it much lighter than our own type? (6119)

The flock of samples No. 1 and No. 2 have been examined, and it was found that they vary in three respects:

First—The dressing used on the fibers. After scouring, No. 2 seems to more nearly approach No. 1 in physical characteristics.

Second—Length of fiber. The average length of fiber of No. 2 is perhaps double that of No. 1, and there is much greater variation in length of the fibers in No. 2. Many of the fibers in No. 2 were very long—perhaps 2.5 to 3 times the average length. There also appears to be a greater variation in fiber diameter in No. 2 than in No. 1.

Third—Kind of fiber. No. 2 appears to contain more than one kind of fiber. The admixed fiber appears to be definitely cylindrical, without longitudinal markings, but

with cross striations and a greenish refraction color, suggesting bast fiber—probably linen or ramie.

It is probable that the second is the most important factor affecting the physical difference between No. 1 and No. 2, with the first next in importance.

Repeat Mark Across Face of Satin

I enclose a sample of silk satin which has a defect on the face. This is an 8-shaft satin, harnesses rising as follows: 1—4—7—2—5—8—3—6. You will note that there is a mark across the face about every 8 picks. I hope you can tell me what causes it. (6132)

The sample submitted is a heavy all-silk 8-shaft satin, which has about 408 ends per inch of three-thread organzine, and shows in certain lights a slight rib across the face. The weave on this was carefully analyzed and it was found that the lift is correct in the cloth namely, 1—4—7—2—5—8—3—6. The inquirer states that the harnesses lift in this rotation and we are convinced that the trouble lies in the fact that the entering is wrong. This lift will only make an 8-shaft satin in a straight draw, so we advise that the harnesses be re-entered skip draw, so that the ends are entered 1—3—5—7—2—4—6—8, and the harness be raised as follows: 1—7—6—3—2—8—5—4.

Mixed Silk in Warp

Can hard silk of different natures, such as Italian and Japan, be mixed in the warp of a single-ply satin or a 3-ply crepe without being detrimental to the finished material? If so, in what proportions can this be accomplished safely? (6123)

As a rule, the mixing of white and yellow stock, or Italian and Japan, involves a certain amount of risk, although the writer has done it many times without any trouble resulting. We strongly advise against making a practice of it. Complete warps should be made out of the Italian, even should the last one be short, in order to leave the remnant as small as possible. If there is then a 10 or 15 lb. remnant left which the manufacturer desires to work in, it should be fairly safe to use it up in a 3-ply crepe,

using one end of each three in a heddle of the Italian. At all times the Italian should be spotted in evenly across the creel, to avoid streaky goods. A satin of a five-shaft construction, spotted end and end, would give a distinct serge appearance and should be avoided. In a six or eight-shaft construction this serge defect would not appear. It would be far safer to work up the small remnant for selvages, as this would relieve the manufacturer of risk and worry.

Meaning of Silk Terms

I would appreciate very much your explanation of the terms "guaranteed basis" and "twenty-three-eleven" as connected with the purchasing of hosiery tram silk on cones. What is the guarantee and to what does the 23% boil-off, and, I believe, 11% moisture refer? (6127)

Raw silk consists of two elements, technically called sericin and fibroin. In trade parlance they are called gum and fiber, respectively. The bulk of the raw silk used for hosiery tram is white Japan, but yellow Japan, Italian, and China silks are also used. The following table gives the range and average boil-off on white and yellow Japan, Italian, and China raws:

Japan white, 16 to 22%—18.90% av.
Japan yellow, 18 to 25%—21.60% av.
Italian, 21 to 25%—23.50% av.
White China, 17 to 22%—18% av.

The boil-off on hosiery tram varies from 19 to 29%, or an average of about 24%.

Raw silk processed or soaked for hosiery tram may absorb from 3 to 10% of the oil, depending on the nature of the emulsion and silk. The same emulsion on different lots may show a variation of 2%. Raw silk is very hygroscopic, or gives off and takes up moisture quickly. Raw silk in a throwing plant operated without humidifiers, during dry days contains from 7 to 8% of moisture, and during humid days from 9 to 12% of moisture. When the plant is humidified and maintained all the year, the variation may be kept within 2%.

These varying conditions render it impossible to produce a uniform hosiery tram of exactly 23% boil-off and 11% moisture regain. A regain of 11%, showing a moisture con-

tent of 9.91%, is the amount agreed upon by an international committee as the normal amount of moisture that raw silk may contain. The 23% boil-off is the minimum amount that hosiery tram should show, and generally is accepted.

These varying conditions show that while it is physically impossible to maintain a 23% boil-off and 11% regain, yet it is possible and practical to trade on that basis, as over a period of time one can establish an average and base one's price and costs on same.

When trading on a guaranteed basis of "twenty-three-eleven" the silk is shipped to the conditioning house for net weighing, conditioning weight, and boil-off tests, and invoiced accordingly. Sometimes the shipper furnishes a certificate showing the conditioning and boil-off tests, and the actual return weight is corrected accordingly.

The costs of making the tests are subject to the rules governing transactions in thrown silk of the Silk Association of America, in the absence of any special arrangement between the buyer and seller.

Making Core Yarn

We find it necessary to make a sample in which a core yarn has been used. This as we understand it is a wool yarn spun around a cotton yarn in such a way that the cotton is well covered with the wool. We are writing to ask you if you can give us any information as to how this yarn is made. (6137)

The usual method employed in making core yarn on woolen machinery is as follows: The cotton yarn is wound on a spool with the same number of ends as there are rings on the top doffer of the card used. The spool is placed on a rack just over the ring doffer, and driven from the doffer, so that the yarn from the spool will be delivered to the rings at just the proper tension.

A guide should be placed just over the wipe roll, with eye hooks, so that the cotton yarn will be delivered in the middle of the ring, going under the wipe roll and into the roping at this point. The material passes through the top rubs and is led down through a bottom set of eye hooks placed over the wipe roll on the bottom doffer in the same manner as in the case of the top doffer. The roping from both doffers gives the core a double covering of web. In

other words, the roping from the top doffer, instead of passing on to the top spool in the usual way, led down to and through the bottom rubs and wound on the bottom spool. Only one spool is taken from the card, in place of the usual two spools. The weight of roping must be figured for full draft on the mule, as it will not be possible to draw to weight.

Hosiery Poorly Degummed

Will you kindly give us your opinion of the cause of the streaks on the enclosed silk hose? These streaks you will notice have a discoloration most prominent in the high spliced heel and about ½ in. from the seam in the back.
(6129)

The difficulty that this inquirer is experiencing is caused by improper degumming, or if he is degumming and dyeing in the same bath the degumming agent he is using is not doing its work. We would suggest either a change in the degumming agent or else the addition of a good penetrating agent to the dye bath.

Mercerized Stocking Dyes Unevenly

I am sending you a sample of a stocking made out of mercerized 50/2 yarn that shows stripes that appear after dyeing. I believe this is due to the poor mercerization of the yarn. Such a defect has resulted in the three different makes of yarns that I have been trying, and I should like to know the best way to avoid it. There must be good formulas to dye evenly these poor mercerized yarns, and I trust that you will kindly help me in this direction. I use direct colors of the best brands known, and I dye as usual in monel metal rotary and paddle wheel machines.
(6130)

The sample submitted was examined closely and the yarn from which it was constructed is certainly an example of poor mercerization. Where the twist and size of the yarn varies greatly it, of course, is almost impossible to obtain even mercerization, so in the majority of cases the spinner is chiefly at fault.

We would suggest that you fill your dye machine to the required level, add the dissolved dyestuff and the salt, and

boil. When the dye liquor is boiling enter the hose in the machine and boil for forty-five minutes, then sample. Before the goods are entered into the machine about two to three per cent of a good penetrating agent should be added.

Steam Pressure for Dyehouse

Will you kindly answer the following question: What is the most efficient steam pressure for dyehouse purposes; that is, should a dyehouse do its work as well and efficiently when they are getting steam from the boilers at 60 lbs. pressure, as if they were getting it at 100 lbs. pressure?

(6124)

There is no one most efficient steam pressure for all dyehouses. Efficiency is more dependent upon design and layout of piping system than upon steam pressure. Examples can be given of dyehouses that are operating efficiently at all pressures from 5 lbs. to 150 lbs. On the other hand, any pressure will give poor results if the system is poorly designed with wrong piping sizes and wrong number of outlets. Many plants use the steam first to generate power and the exhaust is carried to the process departments. The power is thus generated very economically.

Steam at 100 lbs. gauge pressure has a temperature of 337.8° F. and a total of 1185.0 heat units per pound. Steam at 60 lbs. gauge pressure has a temperature of 307.4° F., and a total of 1175.7 heat units per pound. Exhaust steam at 15 lbs. gauge pressure has a temperature of 250.2° F., and a total of 1158.3 heat units per pound. The difference in total heat is small, so there is a great advantage in using the steam for power first.

Heavily Starched Lining Finish

We are enclosing a sample of heavily starched lining finish that we would appreciate your help in duplicating. It is 44/40, 8.20, and starched dry in the gray. We have been using a large quantity of glue and find that its deliquescent quality causes it to soften up considerably after a week or so. Could casein be used to advantage in this finish? If so, will you please outline a procedure for its use. We have a two-bowl starch mangle and tenter frame for this work. (6135)

The writer handled hundreds of thousands of yards of this particular class of work some few years ago and never found it advantageous to use glue as a sizing ingredient. As a matter of fact the price which is paid by commission merchants for finishing this class of merchandise calls for the cheapest possible formula. We resorted to the use of white corn dextrine exclusively in percentages according to the various stiffnesses on the finishes we were doing.

The goods were taken in the gray room and sewed together in runs of eight or nine bales; the fabric was passed over a 2-roll starch mangle and the goods immersed below the immersion roller. From the starch mangle they passed directly to a 6-cylinder dryer, over a compensator and onto a 90 ft. tenter properly housed, heated and fitted with a winder. We were able to do goods on such a range at a speed of about 95 to 100 yards per minute.

The writer recalls one particularly stiff finish which we sized with 240 pounds of white corn dextrine made up to 100 gallons when cooked. We would recommend that the inquirer be sure that he uses white corn dextrine and not any of the yellow brands.

We are wondering if the deliquescent quality mentioned may not be the result of some metallic chloride being used in the sizing ingredient at the cotton mill. On cheaper lines of goods this is often a serious difficulty in sizing compounds. If the weavers realized the disadvantage of using such ingredients in warp sizing material they would discontinue such practice.

Holes in Bleached Knitted Tubing

Enclosed please find sample of knitted tubing which is made on a 100-needle machine, 4 feed, from 30s on cones, unbleached. The knitting is practically perfect when we knit it, but when we get it back from the bleacher it is full of holes and damages. The bleacher disclaims all responsibilities, saying that it must be in the knitting, but we cannot find any fault with the knitting or the machine. What can it be? (6139)

The yarn is causing the trouble. Upon close examination you will note that the yarn is very uneven as to count, varying from a fineness of approximately 40s or finer to a 20s or coarser. Undoubtedly during the bleaching process

these fine lengths of yarn, not being strong enough, give way thus causing the holes. This cannot be laid to the bleachery, and if the cloth goes to the bleachery free of holes it cannot be held against the knitting department. A check on your yarn manufacture seems to be necessary.

Temperature for Wool Combing

What should be the temperature of a room to get best results from a Noble comb? Also what would be the proper temperature of the carriage to give best results? Would steam at 10 to 20 lbs. pressure be high enough to make good work? (6136)

To get the best results from a Noble comb the temperature of a room should be at least 75° F. The relative humidity should be 60% to 70%.

The customary pressure in the steam boxes is 40 to 50 lbs., which is equivalent to temperatures of 287° F. to 298° F. Some mills operate with pressures from 10 to 20 lbs. (240° F. to 259° F.) and get good results, but the piping should be larger with these lower pressures. It is very important to have combs properly trapped to carry the condensate away. It is also desirable to have an air petcock in the drip line near the comb circle, or the comb may get air bound and it will be difficult to warm up in the morning.

The following information on proper conditions for combing, which is taken from Albert W. Thompson's book, "Air Conditioning in Textile Mills," will be of value:

"The heat radiated from the comb circles tends to produce an abnormally high temperature in the comb room. The relative humidity should be from 60% to 70%. Because of the high temperature the humidifying apparatus must have ample capacity.

"The evaporation of the moisture liberated by the humidifiers helps to keep the comb room temperature within ranges which will prevent excessive discomfort to the operatives, especially in summer weather.

"Automatic regulation of the humidity is desirable and automatic regulation of the temperature by thermostatic control is also desirable during the winter months. The comb circles will supply the major portion of the necessary

heat and thermostatic control of the heating apparatus will prevent the room temperature from falling below 75° F. in winter. If the heating system is not subject to thermostatic control the room temperature will often rise to uncomfortably high levels, causing an excessive demand for moisture, representing a waste of fuel."

Rough Spots in Silk Hosiery

We are enclosing silk hose which shows a rough ring when turned inside out entirely around the hose. We are at a loss to understand it. There is a possibility of the hose being made from backwound silk. This we are not sure of, however, but we cannot understand the ring showing on the inside only. We have gone over all our boarding and finishing equipments and can find nothing that would account for this roughness. Would you please let us have your opinion on this? (6133)

An examination of this stocking shows two bands where the inside of the stocking is very much roughened. This roughness is apparent on the outside also but to a much smaller degree. Close examination does not show anything more than that the inside seems to be much worse than the outside. When the yarn was ravelled from the stocking very carefully on to a black cardboard background, it did not seem to show any pronounced regularity of roughened spots. Examination of the rough spots shows that they are due to some of the filaments being broken. In some cases, these broken filaments have merely fluffed out a little, while in other cases they have slipped along the main portion of the yarn, eventually making a rather large bunch. Judging from the appearance of the fabric and the yarn, the latter seems at fault; in other words, this defect is not due to finishing equipment.

There is nothing about this stocking or the yarn to show conclusively the cause of the trouble. The bunches caused by the slipping of some of the filaments along the main portion of the yarn could result on the knitting machines from new yarn in which some of the filaments had been broken. This might result from something happening to the top or bottom of the cone, under which conditions it would be possible to have the broken filaments occur over a narrow band as is shown here. It seems more likely,

however, if the inquirer is using backwound yarn at all, that this is back-wound yarn as it is not uncommon to have this defect in such material. If the inquirer is back-winding stockings such as the one submitted, made on a Model K. Scott & Williams with a mock seam attachment, it would seem very likely that he would get this trouble.

As for showing on the inside only, as the yarn is fed to an automatic hosiery machine, the needle draws the loop over a portion of the sinker and then the sinker moves in with the crown over this new yarn. The result is that as the sinker moves in, there is a tendency to force any protruding material toward the center of the machine, with a movement that is a sort of rolling action. In this way any appreciable amount of fuzz would be rolled toward the center of the machine which, of course, means to the inside of the fabric.

Silks for Crepe Weaves

Will you kindly tell us what is the best silk to use for crepe weaves; Japan, China steamed or Italian. We are using 18/20 and 20/22 China steamed filature and are having a lot of trouble with it between warp stop motion and harness, and harness and reed. It is full of fine buttons. Our count is 3/2 in 60 and 3/2 in 55 dent reed. We soak our silk 15 minutes. (6140)

The above question is rather a difficult one to answer as it is largely a matter of personal opinion. Each silk has its own peculiarities, with many arguments both for and against, but any one of the three should give excellent results. It is safe to say that at least 90% of the cloth made today in crepe weaves is Japan stock. It is the writer's personal opinion that the China steams surpass both Italian and Japan in nerve, life and luster, but they must be bought from the best sources and through the most rigid inspection, as some of the China steams coming in are not as good as they should be.

There are, on the other hand, any number of chops from which the manufacturer can choose, which should give him wonderful satisfaction. It is very important in the handling of Chinas to see that the gums are thoroughly softened in the soaking. We therefore advise the inquirer to investigate this carefully, as the bath should be a soft

emulsion and the silk should be soaked sufficiently to soften the gums. The remaining hard gum spots, if any, should be rubbed and broken carefully by hand.

Several of the largest concerns in the industry use China steam exclusively for their work. The Italian silks are extremely classical and even, but many manufacturers keep away from them because of the fact that for an equal grade they sell above Japans.

The boil-off on Italian is also slightly higher than Japan, which is another small argument against their use, but for extremely delicate and fine work, where extreme evenness is required in weaving, Italians are largely used.

Judging by the description of the construction given by the inquirer good China steam should give no serious trouble in weaving, providing silk has been properly handled in the soaking and winding.

Finishing Napped Fabric

Could you please tell me how to finish enclosed piece of cloth. It comes from loom 65½ in. wide, to finish 56 in. I would like to know why my fabric does not stand up. I have a single napper. My pile lies one way. How can I make it stand up? It rubs off and ruffles up. I nap it wet and dry. Do you nap it the same way all the time? Do you think there is mohair in the New York sample?

(6140)

There is no mohair in the so-called New York sample. Analyses of the fabrics give the following results:

New York sample:	62 ends per inch.
	37 picks per inch.
Mill sample:	50 ends per inch.
	39 picks per inch.

The counts and stock in warp and filling are the same in both samples. The trouble with the mill sample is that it is napped on a single-acting napper. Without a double-acting napper you will not be able to get the finish of the New York sample regardless of whether you run it backwards or forwards, or both. As regards napping wet or dry, you cannot nap such a cloth dry.

An expert finisher advises that he would finish the cloth as follows:

Wash, full, wash (some would prefer to full in the grease and then wash, eliminating the second washing, but I think by washing first and then fulling you get a better and more even velour), extract, dye, extract, nap (double-acting napper), dry, shear, inspect, steam, and roll on tubes. I think that would about make the cloth. In fulling I would full in width and very little in length. You have enough width to make a good job. With a double-acting napper you would not have to nap very long to get the close finish and would not lose so much stock. The New York sample weighs approximately 16⅛ oz. for 56 in. finished, while the mill sample weighs about 14½ oz. in 56 in., showing that you must have lost quite a lot of stock in finishing.

Carding All-Wool Stock

We are considering jumping either the first and second breaker or the second breaker and finisher on our Davis & Furber cards and were wondering if you could advise us which would be the most successful in working all-wool stock. In your experience is it better to run the Apperly feed between the first and second breaker or between the second breaker and finisher? (6150)

It seems advisable to run the Apperly feed between the second breaker and finisher, as the doublings at this point will serve to break up the unevenness and give more uniform roving. It would be an easy matter to jump the second breaker by running the drawing from the first breaker over the second breaker to the Apperly feed on the finisher.

Bars in Rayon Knit Fabric Due to Loose Courses

We are sending you a cut of tubular knitted fabric made of 150 denier rayon. As you will notice this piece is badly barred across the width. Will you kindly decide for us if this is due to uneven yarn, faulty knitting, or dyeing? We are dyeing this fabric for a knitter and have this bad effect from time to time. We have been able to overcome the defect in certain other pastel shades, but have not found a substantive dyestuff that will correct the fault in deep

pinks. The knitter claims the matter is up to the dyer. Your opinion on this subject will be greatly appreciated.
(6155)

A preliminary examination of this piece of knitted tubing showed rather wide bands, regularly spaced at intervals of about one-quarter of an inch. From the face of the fabric it was difficult to tell what the trouble was. Examination of the back with oblique lighting, with a low power magnifier, showed some courses which were conspicuously looser than others. When held up to the light a series of several courses seemed to be looser than the rest. When these were marked it showed five loose courses and nine normal courses.

The stitches per foot of yarn were counted on sixteen consecutive courses and the results were as follows:

Course in Tube	Stitches per Foot
1	126
2	122
3	122
4	118
5	123
6	120
7	120
8	125
9	123
10	117
11	118
12	116
13	116
14	117
15	123
16	120

These figures should start to repeat at the fifteenth course, not with absolute accuracy, but with approximately the same figures. However, the test should be carried further to show this repeat of these conditions.

Note that in the preceding table courses 10 to 14, inclusive, were all less than 120, while the others except course 4 were all over 120. This indicated that courses 10 to 14 had longer loops and were looser texture than normal and so this confirmed what had already been observed in the fabric itself. While course 4 was looser than normal it might have passed unnoticed, but when there

were five loose courses together they so accentuated the condition that it became apparent. On the other hand, perhaps course 4 would have been conspicuous if it stood alone in a fabric, while in the case it was buried by the greater defect.

In an attempt to determine whether the trouble was due to different yarns, lengths were ravelled from all feeds, in groups, in three sets of 4, 5, and 5 ends. The five ends from the loose courses were kept in the second group. Within the various groups, the yarns ravelled at about the same rate, but the group of yarns from the loose courses ravelled at a little slower rate than the other two groups, indicating that the courses were of longer stitch.

The three groups were as follows:

Ends	Yards	Total	Grains	Denier
4	18	72	18.0	159.5
5	18	90	22.2	157.3
5	18	90	21.9	155.2

This indicated that there was no particular difference in the yarns and so the trouble was not due to different yarns.

The cause of this trouble was most likely the knitting machine adjustment; while it may have been either stitch or tension adjustment, it seems most likely the former. Probably a group of five of the fourteen feeds were drawing longer loops than the rest. We do not feel that the dyer is at fault in any way.

Relation Between Skein Breaking Strength and Single-End Breaking Strength

Will you please let me know the relation between skein breaking strength of yarn and single-end breaking strength. In other words, if I know the skein break of 18s cotton yarn in pounds what formula can I use to find the single-end break of this yarn in ounces? (6145)

The relation between single-end and skein breaks can be found approximately by dividing the skein break (expressed in pounds) by 7.3, which gives the single-end break in ounces. This is simply a rough formula that is used to get approximate results.

Tests on Dyed Hosiery Yarn

We are sending part of a hose knitted from our yarns by one of our customers. This yarn was sold to us as developed black, and we in turn sold it the same way. Our customer advises us that this yarn bleeds very badly. It is used in an ordinary cheap men's hose. We have attempted to wash this with hot and with cold water and find it to bleed very little. We would greatly appreciate your views in this matter, as we believe our customer is taking undue advantage of us by asking us to accept return on this material. (6153)

We have examined the smaller piece of hose and made four tests on it. In the first test the hose was braided with pure silk hose and cotton yarn and soaked in cold water for two hours. There was no bleeding into the silk or cotton from the black whatsoever.

The second test was to soak the material in water heated to 120° F. for a period of twenty minutes. This showed no bleeding whatsoever, and the writer then brought this up to a boil and boiled it for twenty minutes. There was no perceptible bleeding from the black into either the silk or the cotton.

The third test consisted of scouring the stocking in a neutral olive oil soap solution of 10% at 120° F. for 20 minutes. This produced no bleeding into the silk or the cotton whatsoever. As this would be as severe a test as anybody would put hosiery to in the ordinary washing operation the writer was curious to see if he could find some means of making the color bleed.

Therefore a hard water soap was selected. This soap contained three-tenths of 1% of free caustic soda. This soap also contained 15% of soda ash. The bath was heated up to 150° F. and held there for 25 minutes with continual working of the braid. There is no perceptible bleeding even under this severe treatment.

The writer is of an opinion that this is an exceptionally good fast batch of developed black and doubts very much whether a sulphur black would produce any faster results. The bleeding which is complained of is evidently a result of abusive treatment, such as boiling the hosiery with an excessive amount of alkali or allowing it to remain in a wet or damp condition for a long period of time. For or-

dinary purposes, especially cheap men's hosiery, this dyeing would be perfectly satisfactory and the knitter would not be justified in demanding that the yarn be returned for credit.

Unripe Cotton in Finished Cloth

I am sending you three samples of cotton sateen. You will notice they are full of motes. I would like to know if these motes can be removed? These samples have been given the caustic bleach. (6148)

An examination of the samples of cotton sateen shows that the imperfections are due to what is commonly called dead cotton. These fibers of unripe or dead cotton have little affinity for dyestuffs and when present in woven fabrics are a source of difficulty to the dyer.

There is no practical method of removing these imperfections from the fabric; and the spotty effect is due to no fault of the bleacher or dyer.

It was not stated in the inquiry by what method the goods were dyed. It is suggested that light shades be pad dyed, using a heavy nip; shades too deep for pad dyeing may be brought partly to shade on the jig and then topped on the pad. The writer has found that this procedure gives somewhat better results than jig dyeing. It is probable that the heavy squeeze forces some of the dye liquor into the dead cotton and in that way causes it to be less conspicuous.

Stains and Shrunken Cotton in Laces

During the last six months we have had at irregular intervals (three times in all) goods stained as shown by the enclosed samples of laces. In the last kier boil we had 30 pieces of this class of goods in the kier, of which two pieces showed the stain and shrunken cotton. We are using kiers of three-ton capacity with outside circulation. At first it was our opinion that the stains were due to the liquid in too concentrated a form running on top of the goods. In consequence, we dissolved the ingredients in the full amount of water used but we have again had the same difficulty. This type of damage only appears in goods which are woven with very fine cotton, and we have never noticed anything of the sort on materials made of

the lower counts. Would you be kind enough to examine these pieces and advise us your opinion as to the cause of damage? (6149)

The fabrics showing stains and shrunken cotton were examined in the following manners: After removing the finishing material with diastafor, the swatches were bleached and then tested with Lange's solution. The shrunken portions of the goods were colored a deep blue by this reagent, showing that the fabric in those places had been subjected to the action of concentrated alkali.

Since the alkali had been dissolved into the full volume of water needed for boiling it seems probable that the trouble arises from one of two conditions: first, the goods were not properly packed in the kiers, which might cause air pockets and channeling of the liquor through the goods; or, secondly, the fabric was allowed to dry without sufficient washing, thus permitting the alkali to become concentrated in those places where the washing was incomplete.

It was found upon redyeing the swatches that had been desized and bleached that the stains reappeared. If, however, the goods before redyeing are first treated with caustic soda solution of mercerizing strength the stains no longer appear.

The fabrics submitted are of such porous construction that it is possible that increased attention to the packing of the kier and to the washing of the goods after boiling will not entirely eliminate the trouble. It is suggested, therefore, that fabrics of this type be scoured and bleached in rope form in a dolly washer or a reel machine.

Test for Silk Gum in Boiled-Off Silk

We would appreciate it if you would advise us if there is any method other than that of Field by which we can ascertain the amount of gum still remaining in silk and silk and rayon hosiery. (6158)

We know of no method termed the "Field" method for estimating the amount of residual silk gum or sericin remaining in boiled-off silk. We wonder if the inquiry was stated correctly or whether the inquirer means the feel or handle of the silk.

To our knowledge there is no simple method of determining the amount of gum remaining in boiled-off silk. This can only be obtained by chemical analysis. The following method will serve to give approximate amounts of silk gum remaining in boiled-off silk. It is a simple process in the hands of an experienced chemist, but might offer difficulties if attempted by a person not familiar with chemical analysis. The method is as follows:

A carefully weighed sample of the material in question should first be extracted in a Soxhlet extractor with ether to remove any free oil or fatty matter present, resulting from softeners used in finishing silk. After the sample has been thoroughly extracted with ether it should be dried to evaporate off the ether, then extracted for a number of hours in the same apparatus with boiling water. This will remove all traces of silk gum or sericin. The water extract, which can be considered as crude sericin solution, should then be treated with a sufficient amount of 1% acetic acid, which precipitates the silk gum. This should then be filtered and the crude gum given several washes with water, then a wash with boiling alcohol, and finally the residual gum is extracted with ether and the gum is then dried and weighed.

Wet and Dry Breaking Strength of Yarns

Kindly forward information on the wet and dry breaking strength of the following yarns: 18s cotton, 30s combed cotton, and 60/2 combed cotton. We are trying to get figures showing how moisture affects the strength of these yarns. (6144)

Wet and dry are relative terms when applied to hygroscopic materials like cotton or other textiles. The moisture content of yarns will change from hour to hour if the moisture content of the atmosphere changes. When humidity conditions are not controlled all textiles are constantly either giving off moisture or taking it up, in an effort to get into a state of equilibrium with the surrounding air. We believe that the following figures, which have resulted from private tests, will cover the inquirer's needs:

18s cotton yarn has a strength bone dry of 87½ lbs. The same yarn with 6½% moisture content broke at 109.4 lbs. The same yarn soaking wet broke at 116.3 lbs.

30s combed cotton yarn bone dry broke at 68.2. With 6½% moisture content it broke at 85.2 lbs. Soaking wet it broke at 90.5 lbs.

60/2 combed cotton yarn bone dry broke at 26.7 lbs. With 6½% moisture content it broke at 33.4 lbs. Soaking wet it broke at 35.5 lbs.

Finishing Lightweight All-Wool Flannels

Would appreciate any information you can furnish on the finishing of ladies' lightweight all-wool flannels; goods to finish about 9 ounces. Am interested to know how they should be fulled, handled in the washers, nappers, and any other details. (6170)

The quality of the stock used has a great deal of influence on the processes of finishing flannels. Some of these goods are made with worsted warp and wool filling, while others are made of all carded woolen yarns that are spun to fine runs. A finisher of such goods replies to the question as follows: We always wash ladies' lightweight all-wool flannels first and then full them without the trap to about 56-57 in. width. The cloth loses about 2 in. per yard in length in the fulling mill. After the fulling the goods are taken back to the washer to be cleansed and rinsed very thoroughly, which takes about 1½ hrs. for a 12-piece set. The goods are then sent to the dyehouse and after dyeing they are dried, then cropped on the shear and pressed. It is necessary to use a very good soap in the washer as this helps to keep a soft handle which is so much desired in ladies' flannels. Constant attention is required in the finishing as the cloth fulls very quickly when it starts to go.

Defects in Braided Shoe Laces

We enclose a sample of shoe lace. It is made with 32 strands of 26/2 mercerized cotton, and 12 strands of 300 denier rayon. You will note the bad places in this braid, which are not caused by broken ends. We would appreciate your suggestions as to how we could eliminate this trouble if possible. We cannot understand why this happens, unless it is due to the rayon used, as it does not occur in our regular cotton braid. (6163)

The difficulty appears to be caused by one bobbin running too loose and allowing the thread to lag and become momentarily entangled with the following threads. Top or bottom weights that are not heavy enough will cause the same defect, or, if racer carriers are used, springs that are not strong enough.

Another cause may be a worn ratchet on the head of a bobbin, or an imperfect let-off lever that engages the ratchet. Sometimes if a top weight flies off and the stop-motion fails to function the same defect will be noted in the braid. We would suggest a check-up on the size of the weights to ascertain that they are all the same, and incidentally on the counts of the black yarn, some of the threads of which look decidedly unlike 26/2 ply.

If the foregoing suggestions are checked-out and the difficulty still continues, we are of the opinion that if the speed of the machine is reduced the trouble will entirely disappear.

Plaid Back Yarns Show on Face of Overcoating

I am enclosing a sample of overcoating on which the overplaid shows through. Can you suggest a way to overcome this? (6162)

The sample shows a considerable amount of fulling, and it is the working through of the fibers from the plaiding yarn that causes or intensifies the effect. In this case the remedy would seem to be to avoid as far as possible an extreme amount of felting; especially the fulling in length. The writer once had an experience where certain styles having plaiding of strongly contrasting colors were treated with as little fulling as possible even with much less felting effect, and the trouble was overcome.

Of course this was the choice of the lesser of two evils, but it proved satisfactory. It was the result of applying the stretchers and lightening up on the pressure to get the goods to the required width with as little working as possible.

Judging from the odor of the sample it seems as though a little stronger soap would result in less time in the fulling mills, which is the point to be attained.

As a precautionary measure we would suggest that the plaiding color be of less felting quality. If there should

be no objection to the use of some cotton in the plaiding yarn, it would help matters as the cotton fibers would not come through in fulling. This, with a suitable deep color to withstand the fulling, would certainly remedy the difficulty, though not applicable to the present construction of the cloth. All-wool stock for the plaiding yarns that did not felt so readily would help.

This seems to be about all that can be suggested. It is a difficulty that always appears with such goods. If the construction can be made so as to finish with less working in the fulling mills, it will improve matters.

Spots on Chinchilla

I am having trouble with spots on a cotton-warp piece-dye chinchilla of which I am sending sample. The spots are marked on the back. They seem to show up more after rubbing. They look like oil spots but we are careful to see that no oil can get on the piece around the machines. I think they are dye spots, but we use a cleaning fluid that seems to dissolve or partly take the spot away. Could you tell me what they are and what could cause them? (6169)

A finisher of chinchillas replies to this question as follows: I have examined the piece thoroughly and to me the spots do not look like oil or dye stains. I had a similar experience once and we found the spots were caused by using ammonia to clean our chinchilla machine; that is, the table and the rubber surface of the machine. We had some ammonia left on the rubber and this made spots on the cloth. This may be the inquirer's trouble. It is very difficult to state definitely what causes the spots where we do not know the full particulars of the way the goods are handled. I feel quite sure, however, that the spots are not due to oil or dyestuff.

Uneven Filling in Chambray

We are enclosing herewith a sample of wavy filling in a piece of 32-in. indigo chambray with which we have been having trouble, and would thank you to advise us your idea of what is causing this trouble and how to remedy it. Note that we are sending a piece large enough to show one complete filling quill, as the piece shows where the loom changed twice. (6177)

The weaving is perfect. The trouble is caused by very

unevenly spun filling. This yarn would show up very poorly even if a light colored warp were used. With a blue warp the unevenness is emphasized. A magnifying glass shows that some parts of the filling are about half the diameter of other parts.

Taking out about one dozen picks from the whole width of the cloth and placing these picks on a black surface shows the thin and thick places very plainly. This is a problem for the spinning room, not for the weave room.

Piece Work on Worsted Drawing

Can you give me some idea of how to put the drawing department (Bradford system) on a piece-rate basis. I am running a fancy mill, putting through many small lots of different counts, qualities, and shades, and in running out a lot a great many spindles of necessity are non-producing a good deal of the time. I am looking for a good practical solution but have not found it yet. I shall be greatly obliged if you can help me out on this. (6176)

We believe that the inquirer is seeking the impossible. Systems of piece work are effective when on good sized lots, but are useless on small lots where there is so much running out. We know of no mills that have their drawing on piece work when running small lots. There are plants that have tried some system or other of payment by piece, but eventually they have had to go back to the old day-pay system.

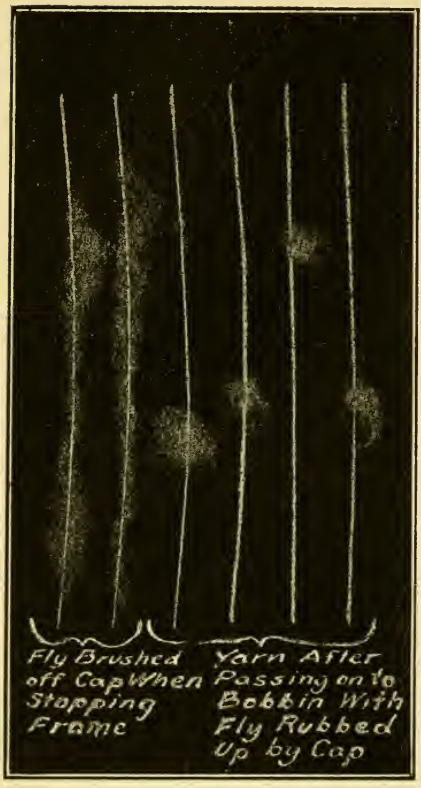
A worsted superintendent replies to this question as follows: This is a problem that many mills would like to have solved. The nearest that mills have come to solving it is to keep track of the number of hours each girl works on each lot, regardless of how much the lot consists of. If a lot consists of 50 lbs., a girl might be running one-half the spindles on a machine but she has to be paid the same as if she were running all of them. Unless you are running lots that will keep machines going to full capacity continuously, you have to put up with extra costs. It might be possible to work out a piece rate by having extra help follow the lots through. But then you would add to the cost of bookkeeping. The simple way is to have the overseer put down the number of hours on each lot for each girl; then the office can figure out rates but it means extra

clerical expense. The overseer can probably do as well without any extra expense. Too much system breaks down of its own weight. Samples are always very costly and it is difficult to figure the costs of them.

Some mills pay the speeder tenders on piece work and the rest of the drawing on day work. Many firms think day work is best all around, because the help makes too much bad work on piece work. But everybody has to work out what he thinks is best for his mill. You get more waste on piece work, as well as less care of the processes. Sometimes you get a lot that is not so clean as the average and it ought to get more care, but piece workers will not give this extra care because there is nothing in it for them.

Slubs in Worsted Yarn from Fly on Caps

We are spinning 2/30s, 64s quality, and are experiencing quite a lot of trouble with fly. We have spun thousands of pounds of similar yarn and never had trouble like this before. It is something new for us. As the spinning frame stops, and the end from the roller to the cap edge ceases to balloon, before it finally comes to rest it sweeps or brushes the fly from the side of the cap, covering the end for a length of two to three inches with fly. As the frame is set in motion again this fly is rubbed up into a small slub, against the edge of the cap. If the cap fails to do this, then the tension discs or guides on the doubling frame accomplish it. The slubs that are thus made when stopping the frames for doffing are easily taken care of by pulling off a length of yarn when tying-in at the doublers. In passing I may state that previous to twisting all the yarn is doubled. Unfortunately we cannot resort to this method when the frames have to be stopped for other reasons than doffing; for instance, at noon and at finish of the day. We are overcoming the difficulty a little by having the frames stopped every half hour for a second or two between doffs. This causes the fly to be brushed off the cap before very much has accumulated. Even then we get a certain amount. A singular feature is that this particular lot has far less short in it and is cleaner in all respects than other lots with which we have had no trouble. Our spooling production has decreased 50%, owing to the number of slubs in the yarn. We have tried stopping frames fast and slow; applied kerosene to the caps; used both olive oil and emulsion on the tops; put more twist in



the single up to 13 turns. All this has had no effect. We use 4 x 1¾ in. double ended bobbins. I would be grateful to have your opinion on this trouble. I enclose samples of top and yarn. (5962)

The whole trouble is with the top. It is finer than 64s and has a very poor staple. Maximum length is 5 in. Analysis of the top on the velvet board revealed the following facts:

(1) Only 3% approximately of the fibers were over 4 in. in length.

(2) 49¾% of the fibers were between 2 and 4 in. in length.

(3) 47¼% of the fibers were under 2 in. in length.

(4) The top had been lightly noiled on the Noble comb. There is so much short that if it were not for the presence of neps and foreign matter it could pass as a French combed top. We compared it on the board with a straight French combed top, and we preferred the French top to make 36s counts from.

(5) The staple is of fair strength but would require gentle treatment to prevent breakage.

"Fly" is short fiber either present in the top or else

created in the drawing and spinning processes. It always exists, even in the best of wools, but this lot with its 47% of shorts will produce an excessive amount.

We offer a few suggestions which may help to reduce the fly somewhat. In the drawing, set ratches as open as possible consistent with an even end. Set rover for 4¾ in. and open up ¼ in. on each preceding box; that is, if the stock will stand it. Keep carriers close to front roll on fine end. Soften twist as much as possible, even if drag has to be eased a little. Avoid too high speeds on the rover. Condition roving if possible. Keep humidity about 55 to 60% relative humidity. Temperature 70 deg. F. or higher.

In the spinning room, set flyboards so that "twist" runs into the nip as much as possible. Increasing angle of rolls to 40 or 45 deg. with the horizontal will help quite a little. Avoid high spindle speeds; 5500 to 6000 is high enough for this lot. Set the "drag" so that a minimum amount of contact with tin separators will result. This is helped by having spindles as low as possible, but not low enough to cause yarn to strike shoulder of cap. Use a low draft in spinning, about equal to staple plus one-half. Four and three-quarter inch ratch would mean 5¼ draft.

Keep roving on light side and follow advice about low drafts in drawing room also. On gill boxes do not exceed 4¼ or 4½ draft and let 5 be maximum draft in drawing. We trust that these suggestions will help you a little, but we feel sure the top is not suited for your purpose.

Holes in Knit Goods after Dyeing

We are having quite a bit of trouble with the cloth that we knit on spring-needle knitting machines. Before the goods are put into the dye, they seem to be perfect. After the cloth has been dyed, it is apparent that somewhere in the dyeing process there is something that causes holes in the cloth. We find 20 to 30 holes in each piece. We are enclosing a swatch of cloth which shows the kind of holes we mean. Could you tell us what the trouble is? (6193)

There are several causes that may contribute to the holes being found in the goods. Poor needles will cause very small holes to break out during the process of dyeing. These holes do not appear before dyeing, but, on examining the cloth closely after coming off the knitting frames, you

can notice at times that there are stitches just about ready to break. A rough kettle and reel, or a nail lying in the bottom of a kettle will cause plenty of trouble. After dyeing, the goods should be flat folded in order to make sure there are no holes before going to the dryers.

If the holes are found in several or more pieces after dyeing, and the goods are all right before dyeing, and the dye kettle is in good condition, it will be well to look the goods over carefully before sending them to the dyehouse.

Overcrowding the dye kettle and putting undue strain on the pieces will result in producing holes. It is possible the acid is not thoroughly removed and is giving you some trouble. If you wish, we would be glad to give you standard methods for dyeing underwear knit goods.

Silk Yarns Too Fine for Hosiery Machine

We would appreciate an expression of opinion as to the probable cause of the sleaziness so apparent in the stocking attached hereto. While we are of the opinion that it is a machine difficulty, our customer feels it is in the yarn. The stocking is reasonably soft to the touch and we cannot understand why such a yarn will not make a better fabric if the machine is properly adjusted. (6182)

You will note that the sleaziness is in the upper part of this circular-knit stocking and not in the ankle and foot. This indicates that it is due to the loose stitch drawn at the top to allow the stocking to stretch. Another item to consider is that the stocking was knit using yarns rather fine for the gauge of the machine, and does not really make a substantial fabric unless a very short stitch is drawn.

The stiffness of the silk may help to produce this trouble; and, when silks are not uniformly oiled or conditioned, it may help in giving this sleazy appearance.

Really the trouble is that the loops of a wale do not run in a perfectly straight line but make a zig-zag line in some places. This trouble has come since the advent of chiffon hose on machines not really fine enough in design to suit the yarn used. When a machine suitable to handle 10- or 12-thread silk uses 5-thread silk, it must be expected that some trouble will result in producing the fabric.

While this silk seems to be somewhat uneven and makes bands or "rings," there is nothing to indicate that this particular trouble is due to faulty yarns.

Preparing Carpet Yarn for Shipment

Will you please advise us as to what is the best way to twist and ship carpet yarns? (6194)

Carpet yarn is usually spooled and twisted on a ring twister into two or three ply as desired, then is skein wound in a specified weight of skein. It is very important that the skeins are tied properly when taken from the skein winder in order to prevent the yarn from becoming tangled.

The usual method of preparing for shipment is to twist several skeins together over a peg and pack into a square wooden form with open top, which holds about eight or ten of the skeins when doubled together. The bundle is tied on both ends and taken from the form. This makes a neat square bundle which is easily baled or bagged with others for shipment.

The ring-twister method seems to be the most practical and economical method to use in twisting carpet yarn.

Silk Mill Profits

Please advise us how much profit per yard, net to the mill, a silk mill should make running 100 looms day and night in the North? We will presume the mill is running a standard georgette crepe or crepe de chine, and that the market is in fair condition. In other words, we would like to know about what profit per yard can be figured on. (6180)

This is an impossible question to answer. The situation changes from month to month. There are hardly two mills in the country manufacturing on the same basis, and the profit is largely dependent upon the method of manufacturing, equipment, general management, and market price at which raw materials have been purchased. Also important is the amount of seconds produced which have a direct bearing on ultimate profits, and whether or not the mill is equipped to do its own throwing. On top of this is the law of supply and demand, which largely governs

the price of the raw cloth, regardless of manufacturing cost, or cost of raw materials, and there is no basis we can think of for giving an accurate reply. Just at the moment all qualities of georgette and crepe de chine are selling under cost of production.

We have often seen raw silk at $6, and a certain quality of crepe de chine selling at $1.10 in the raw. Three or four months later the raw market may be $1 higher and the cloth may be selling at $1 in the raw. These fluctuations in the market are usually due to over-production and the rapidly changing demands of fashions, which often leave the mill with a surplus of merchandise on its hands which it is forced to liquidate regardless of cost, in order to meet its obligations.

Many of the best mills in the country have shown consistent losses for the last few years, and we are powerless to predict when this condition will change. You state that the plant runs night and day. This in itself is one of the things which has helped create the terrific over-production from which the trade is now suffering.

You further state that the question should be answered on a fair market. A fair market of course is largely a matter of personal opinion. Some owners of mills draw a legitimate living from their business, which consequently may leave very little for profit on a close market, while another concern of the same size and equipment and manufacturing under the same conditions may have partners who draw but a meager living, and the difference in drawing will show as a profit, the result being that one mill is satisfied with its profits while another can hardly support its members.

Thready Appearance and Moire Effect on Cotton Broadcloth

In the past you have on several occasions been good enough to render valuable service to the writer in reply to his inquiries touching certain matters. We have been having some trouble in satisfying certain of our customers in the finishing of mercerized broadcloth, especially the 120 x 64 and 144 x 76 combed 2 x 2. We are enclosing you two swatches, one marked "Finish Wanted" and the other "Our Finish."

We would certainly appreciate your helping us out in this matter, advising us just wherein you think we are at fault. You will note that our goods are not anything like as thready as the sample marked "Finish Wanted." We are able to secure this thready appearance by chasing, but we find that the goods have a more or less moire effect, which, of course, is objectionable.

We have used in the finishing process nothing but a pure sulphonated olive oil, blue to shade. We have both five- and seven-roll calenders, and have given the goods a pretty thorough trial on both of these calenders. (6205)

The usual method of finishing two-ply broadcloth to obtain the "thready" appearance shown in the sample marked "Finish Wanted" is practically the same as outlined in the inquiry.

Either sulphonated tallow or sulphonated olive oil is applied on a two-bowl mangle, the goods dried, framed, calendered, steamed, and again framed. Single-ply broadcloth is usually given a satisfactory appearance by chasing, and this method is also used by some finishers on two-ply fabrics. Either a five-roll or seven-roll calender may be employed. The objectionable moire effect which the inquirer has encountered is probably due to either the construction or condition of the calender rolls and should be easily remedied.

While chasing will often give fairly satisfactory results on two-ply broadcloth, it is doubtful whether the appearance will equal that of the sample marked "Finish Wanted" This fabric not only is exceptionally well mercerized, but it also has the appearance of having been finished on one of the newer types of calenders which are particularly suited for this class of work.

French-Worsted Yarn Uneven

The enclosed part cop shows very clearly a trouble we have been encountering at intervals on our jersey cloth and some weaving yarns; viz., a soft or untwisted place of varying length which seems to occur intermittently for no apparent reason.

The natural conclusion on seeing such yarn is that a spindle band has been allowed to run slack; but this is not the case, as the yarn runs uniform and strong until one of these unspun places appears, and then after unwinding a

little we find it normal again. Our boss spinner claims it is in the roving, but is unable to show roving uneven enough to cause such a defect, and the soft place itself appears to have sufficient fiber in it to have spun the required count. We do not find a radically thin place, which he contends would "take all the twist" in each stretch. The spindles are solid, straight, and well cleaned and oiled. They appear to have nothing to retard them in turning. (6208)

Your spinner is correct. The yarn is very uneven. The thin places are taking the twist, leaving the thick heavy places very softly twisted. The yarn shows evidence of overdrafting. Perhaps your spinner is making the trouble worse by using too much drag. We note that you are using a very soft twist; and, as the yarn is uneven, the drag, if excessive, will make matters worse. If we could see the mules running we could more definitely locate the trouble. We offer the following suggestions:

(1) Reduce "drag" to a minimum.
(2) Avoid excessive speed of the mule.
(3) Use minimum winding tension.
(4) Have gentle backing off.

If none of the above cure the evil,

(5) Make a lighter roving, or a better roving by improving the drawing layout. A reduced spinning draft will help greatly.

Dyeing and Softening Silk-Rayon-Cotton Hosiery

I am sending you several pieces of hoisery made of pure silk and rayon with mercerized cotton tops. These have been dyed in a paddle machine with the one-bath process. What is your opinion in regard to the softness and dull finish of these goods? What is your opinion in regard to the match of color between the cotton tops and silk mixtures? Could you suggest anything or any way that would improve these goods so that they would have a softer feel and a duller finish; also a more uniform match between the silk and cotton? (6186)

These samples were examined very closely and it was noted that the unions were good in some cases and very bad in others. It is suggested that you get in touch with the firm from whom you are purchasing your dyestuffs

and see that they are selling you the best dyes for obtaining good unions on your class of work. A good oil will soften these goods, using from 2 to 3% in the dye bath. The metallic luster may also be eliminated somewhat by use of the proper oils.

"Form-Fashioned" Stockings

What is the meaning of the term "form-fashioned," as applied to ladies' stockings and men's golf hose? (6179)

A "form-fashioned" ladies' stocking is made with a full-fashioned foot, a cut ankle, and a seamless leg. There is no golf hose of this description on the market.

Speeds and Travelers for Cotton Ring-Spinning Frames

We are installing eight new Whitin 8-in. traverse, 2-in. ring-spinning frames to spin 10s and 12s yarn from 1 1/16-in. cotton, 2-hank, single roving. The frames have 126 spindles on a side, 252 to a frame. What speed would you recommend to run the spindles? They have tape drive and the latest type of spindle. The cost and production are not considered, but a speed is required that will make the work run at its best on these numbers. Also what number of National ring traveler would you recommend to start on the frame with no separators? (6187)

We would expect on new Whitin spinning frames with 2-in. ring, 8-in. traverse, without separators, that on yarns 10s to 12s warp count, a mill would be able to run the spindles approximately 7500 turns on the 10s, and 7850 turns on the 12s. These speeds are taken from the catalogs of the builder and are figured on frames without separators, and we believe that these speeds are not excessive if you are using cotton of suitable staple and strength, and if you are preparing your roving in the best possible manner.

We note in your inquiry that cost and production are not considered but that a speed is required that will make the work run at its best on these numbers. We presume from this that you are anxious to get good running work, and we should imagine your help is not efficient. Even in this case, if the cotton was of suitable staple and strength,

and if the roving was properly made, we would feel that on 10s and 12s warp yarn it would be possible to run the spindles from 7300 to 7500, the 7500 being probably a speed that could be maintained with good running work. Most mills have conditions of their own that govern the speed at which the spinning frames can be run, and in such cases we can only give our estimate of what we think could be obtained. If you find that you are not able to run the speeds specified, there are probably conditions in the mill that prevent these speeds, and in such case you should experiment at different speeds until you find the speed at which your work runs best.

We feel that you should try out travelers Nos. 6, 7, 8, 9 and 10, to find out which ones would be best suited for this work.

Operators on Tire Cord Yarns

We are to operate two Foster winders of 30 spindles each on 23/5/3 tire cord. I would like to know how many operators would be required to do the work of both tending and splicing on these machines in order to produce the best results economically. (6209)

This is the Foster Model 23, 9-in. traverse machine which is in general use in mills spinning and twisting tire cord for use in rubber plants. The best help layout we know of in any mill using these machines is as follows:

The mill uses as supply a 5 x 8 spool. One operative does the splicing on 20 ends, not doing any other work. One man attends to the doffing on 120 spindles and also takes care of the supply; that is, removes the empty spools when run out and puts new spools on the spindle, so that the only work of the girl is splicing the ends. In such a mill they would require at least 120 spindles.

In a mill using 60 spindles we believe the best arrangement is for a hand to attend 15 ends, doing the splicing, taking off the runout spools, and putting the fresh ones on the spindles. As a full package weighs up to 14 lbs., a man or boy should be supplied to doff these and remove them from the frame; also bring the full spools, distributing them near the machine so that the splicing operative can handle them quickly. Of course a great deal depends on the size of the full spool. If the spool is less than

8 x 5, with correspondingly less yardage, there is more splicing. Naturally the skill of the operatives enters into the matter very largely. If the operatives are used to working on the machine and managing the splicing, they are always able to attend more spindles than when machines are first started in a mill.

Diameter of Dresser Cylinder

What are the relative merits of the dresser cylinder of large diameter vs. the cylinder of small diameter? We are particularly interested in its application to jute yarn, but, nevertheless, we would be glad to obtain information, if possible, in connection with cotton yarn. (6199)

The first main point in favor of the cylinder of larger diameter is the additional drying surface, which permits higher yarn speed and larger production. Larger production in turn lowers the cost per pound of slashing. Second, a heavier sheet of yarn can be dried on the larger cylinder than on the smaller one at the same speed. Third, a heavier size mixture can be used.

Some builders claim a cylinder of seven-foot diameter has given the best results and so have adopted that size as standard. If more drying surface is needed, it is the writer's opinion that by adding another five-foot cylinder to the machine better results can be obtained than by increasing the diameter of the single cylinder.

Chafe Marks on Silk Goods

We have considerable trouble with our silk goods, especially satins, coming in from the dyers with chafe marks. Some of the pieces show only light chafes, and we wonder if these could not be removed or at least something done so that they will not show up so badly. Anything you can advise will be very much appreciated. (6202)

If you are sure that the marks shown are really chafe marks, it is quite possible that the dyehouse can improve on the appearance of the silk. The next question to solve is where the chafe marks first appear, whether out of the dye machine or out of the extractor. If the pieces are dyed in an open tub with a winch, the winch should be covered with a piece of cotton cloth. An important point to ob-

serve is that there should be always enough liquor in the dye bath to properly float the batch of silk; otherwise the pieces are apt to become caught and the winch to revolve, causing the marks. Next, it is quite important to see that all boxes and baskets, into which the silk may be run, do not have any sharp edges. These edges should also be covered with cloth. If the pieces are dyed in a jig, examine all rollers for rough places.

In other words, to get rid of chafe marks, examine the dyeing and finishing machines for rough places and be sure there is enough dye liquor in the dyeing machine to float the pieces easily so that they will not drag either on the bottom of the dye box or on the winch.

Picks in Flat Crepe Construction

Will you please advise us on the following: We are making a flat crepe, 72 x 330, and we find that some of our cloth varies in pick after springback between 73 and 73¾. We would like to know if this variation would show up as cross bars in the finished cloth. This cloth is weighted 20/22. Any information will be greatly appreciated.

(6219)

It is almost impossible to put in exactly the same number of picks with a given pick gear on every loom. There is likely to be a variation of 1% either way. The diameter of the sand roll is figured correctly by the loom manufacturer, but when the sand paper is changed due to wear, if it is not replaced with exactly the same thickness of paper, it will make a very slight variation in the pickage; though this is drawing the line rather fine.

On the average, if a loom is true and lays 72 picks under tension, 73 to 74 would be about correct when the cloth is loose, on a flat crepe construction, according to the tension under which the cloth was woven.

We do not think that a variation in the piece of from 73 to 73¾ picks per inch would be very noticeable in the dyed cloth, but it would be far safer for weighted goods if the variation could be overcome, as weighted flat crepes are extremely treacherous, and very often the slightest variations exaggerate themselves in the weighting. We do not believe that this is due to unevenness in the filling, because a 72-pick cloth in a flat crepe construction, 4-thread filling,

takes 72 picks very easily, and should the filling run slightly heavy in spots there is not enough banging to make a variation of pickage.

We have seen in our experience a slight variation in pickage due to the sand roller pinions not being exactly centered, and also to the fact that the sand roller itself may be ever so slightly elliptical in shape due to wear. Further than this, variation may be due to the fact that the sand paper may not have been put on accurately, and there may be a lap causing a greater or lesser diameter at some particular point, resulting in a slight decrease or increase in picks at that spot. We would advise the manufacturer to string these spots that show a variation in the raw cloth at the selvage and watch the pieces after they are returned from the dyer to see if they are noticeable. If the variation is due to the tension ropes it will be noticeable in the dyed cloth, and this is commonly known as barre.

Matted and Crinkled Bleached Skein

I am sending you one skein of bleached yarn which shows a matted and crinkled condition. I would like to have you examine this carefully and let me know what causes this condition. The same thing has also happened in mercerized skeins, and I would like to know where to look for this condition in order to correct same. (6217)

It would be easier to judge this defect if the inquirer had made some statement as to the kind of equipment in which the yarn was processed. It looks, however, like a simple mechanical difficulty which should be easily found. The yarn has the appearance of one end of the skein having floated fairly loosely where there was a violent circulation of water, or possibly a tendency to float upward, such as might result from boiling above an open steam pipe.

The skein seems to have been folded rather sharply at one point which allowed the separate ends of yarn to twist on themselves, or kink, but this was probably promoted by agitation at the same time.

The best procedure is a careful search to determine just where in the process the trouble first appears, when a remedy may be easily seen. Such skeins can be beat out straight by hand while still wet, but that would be only a makeshift solution of the problem.

Yarns for Silk Hosiery—Speed of Machines

I wish you would advise me as to what would be the right size of pure silk to be used on a 3½-in., 300-needle machine, and how fast we could run the machine for best results. I would also like to know the right size of yarn to use in the double sole, the heel and toe, and the welt. Do you think a 10-thread would be proper? (6222)

It is generally considered that a 300-needle machine is intended for chiffon stockings, but there is no reason for limiting its production to this particular class of hosiery. Just the yarn to use for the leg depends upon what is desired. For chiffon hosiery as fine as five-thread silk can be used. Where heavier yarn is used a heavier fabric will result. You can use 10-thread silk if the proper length stitch is drawn. It should make a very nice substantial stocking, but before going deeply into manufacturing it, you might sound out your market for the possibilities of selling this line. You may find that a seven- or eight-thread stocking will have greater sales possibilities.

There is some leeway on yarn sizes for the sole, heel, toe, and welt. The following are usually recommended:

Inside welt —35s carded cotton.
Outside welt—60/2 combed peeler mercerized.
Heel and toe—50/2 combed peeler mercerized or 2 ends of 100/2 combed peeler mercerized.
Double sole —70s combed peeler or 140/2 combed peeler.

There is considerable difference in the speeds used by different mills, as some favor a conservative speed while others try to use a maximum speed. A speed of 220 to 240 revolutions per minute of the cylinder should give satisfactory results for this work.

Knitting Elastic Fabric

Will you kindly advise me on what knitting machine I could manufacture material like the enclosed sample. This material is to be made in long strips in 4 to 6-in. widths with rubber running through so it will become very elastic. I have been advised to use the Dubied Swiss flat knitting machine, but it will not knit this kind of material. (6211)

Material like the sample can doubtless be made on almost any make of flat machine of the proper gauge. There is no question but that some of the Dubied Swiss machines are suitable for this and possibly any of them are. We are enclosing a small sample made on a Lamb machine. In this case the rubber was worked by hand, but this can be arranged to take care of itself. There will be a great many points in adjusting machines to make this material which can best be explained at the machine with the material being knitted.

Bleaching Egyptian Cotton Yarns

We would like advice on the method of using liquid chlorine. We are using a 20% solution (based on weight of the yarn) on Sak Egyptian cotton yarns, although we use a weaker solution on others. We have been running the temperature up to 90° to hasten the liberation of the chlorine. We have been advised that this is rather dangerous as it may tender the yarn, and also have been advised that the addition of acetic acid would hasten the action of the liquid chlorine and eliminate the necessity of running too high temperatures. We would like your advice on both of these points. (6213)

The writer has bleached Egyptian yarns and found them much more difficult to decolorize than ordinary cotton. The remedy used was to extend the time and sometimes to rinse and sour the yarn, rinse and reintroduce into the bleach, continuing and repeating until sufficiently white. This answered the purpose at the time but is admittedly rather slow.

The temperature of 90° is no more than a common summer heat and does not seem excessive or dangerous. If it has given satisfactory results the writer would not hesitate to continue using it. Soaking in the bleach for too long a time might, of course, make trouble. However, at this moderate temperature the danger would more likely lie in the possibility of overheating some part of the lot while trying to bring the whole up to the desired temperature. If this has been guarded against and the work is otherwise carefully controlled, there should be no trouble.

The writer would be less inclined to favor the addition of an acid, although he has used it with satisfaction on other

resistant materials. Probably the liquid chlorine bleach is made up on the alkaline side and it may therefore be slow acting. The addition of a little acid will neutralize some of the alkali and allow a more rapid action. Large amounts of acid may carry the action too far and may even liberate free chlorine again. Unless one can control the solution by chemical analysis, or conditions are particularly favorable to repeating the bleaching in just exactly the same way every time, the addition of acid is liable to be uncertain. However, it is sometimes done.

Neither warming the bleach nor adding acids is much favored by bleachers in general, but exceptional materials often require exceptional treatment and to a certain extent one has to take a chance.

Cotton Thread is Tender

I would appreciate it very much if you could help me out on a problem on which I have been working for some time without getting good results. The thread I am enclosing has been glazed. It has a good stretch and works on the machine without breaking, whereas mine breaks considerably. Please advise whether this is due to the different supply of starches used in the size. (6225)

A thread dyer and finisher replies to this question as follows: I have tested the samples and find that the gray thread is very weak in places. These weak places seem to be very regular and the same distance apart, which gives the impression that the yarn might have come in contact with the iron kier. I once had a similar thing happen to me and it took me quite a while to locate the trouble. I found that when the watchman let the kier go after boiling he would let it stand 20 min. to drain, leaving the yarn exposed to the hot sides of the kier, which caused the tendering. I took one head of yarn, dried it up, and marked the places which had been exposed to the kier sides, and found that they were weakened 20% on an average in just those particular parts. I do not know the inquirer's conditions of boiling but would check up on the point if an iron kier is used.

Are the size boxes kept clean? If not, there is always a chance for bacteria to form which is not always removed when passing over the brushes.

I would suggest taking a head of yarn before boiling and testing the break. Also test after boiling, after dyeing, and after polishing. Sometimes yarn is let stand overnight after being boiled out where it is not all dyed up that day. Yarn so exposed to the air is dried in some places, and you will notice air stains are formed. These make the yarn tender in spots, especially if on the warm side when taken out of the kier. Then it should be remembered that mildew will form in 48 hrs. after the yarn is dried under some conditions.

Also make sure that the "life" of the yarn is not destroyed in dyeing by using solutions that are too strong, or having the material in the bath for too long a time, or in drying at too high a temperature.

Broken Rayon Filaments in Knit Webbing

We are sending you a sample of rayon webbing and call your attention to the small spots in this cloth where the yarn is frayed. We ask your opinion as to whether these spots are due to frayed spots on the yarn before knitting, or whether these spots could have happened in the dyeing operation by the cloth being pulled over some rough place. (6231)

After a close examination of the defects we can find no indication which leads us to consider this trouble as resulting from a dyeing operation. The fabric is not much roughened, considering how apparent the trouble is. In fact, on the face it would seem as though only the distortion of the stitches made the trouble apparent.

Raveling from the sample showed that some of the filaments of the yarn were broken and they caused the defective spot. How these filaments were broken cannot be definitely stated. They may have been broken in the yarn before knitting, or the knitting machine may have fed the yarn so that the needles sometimes split it and so cut a few filaments.

We are inclined to think that the knitting machine is causing the trouble, but cannot be definite about it. Examine every feed carefully to be sure that the yarn is properly guided to the needles and kept at a constant tension. Examine some of the yarn if the trouble still persists after the machine is correctly adjusted.

Luster on Silk-Warp, Cotton-Filled Serge

We are sending herewith two small piece-dyed serge samples of mixed silk and cotton. Our analysis of both pieces is 80/2/2, 13/15 denier, 84 picks of 20/1 cotton. Piece No. 2 shows more luster and appears covered more nicely. Is the difference noted due to the boil-off and finish, or something we have overlooked in the construction? (6228)

The two samples of silk-warp, cotton-filled serge seem to be the same in construction, and we believe the difference in appearance is due to the dyeing and finishing. One sample seems to cover better than the other, and in our opinion it is due to the fact that the silk and cotton are well matched as to color, the cotton being slightly darker than the silk. In the second sample, which does not look quite as good, the cotton is decidedly off shade, being much lighter in color than the warp. This allows it to grin through and causes a rather poor appearance. It also appears that the general finish on sample No. 2 is better than on sample No. 1.

Manufacture of Polishing Felt

Enclosed is a sample of a felt which is used in the polishing of granite, and which I am advised is very expensive. Will you kindly advise where I can obtain information as to how and from what it is manufactured? Also the equipment needed to make this. (6220)

The sample is a typical polishing felt. Various companies manufacture it, such as the American Felt Co., Boston, the Lowell Felt Co., Lowell, Mass., etc.

It is made from wool and felted down very hard. The process is the usual opening and preliminary carding operation, and the web from the former cards may be laid down by a crosser. When sufficient bat thickness has been attained, the bat is hardened or compressed in a hardener, cut into sheets and felted with a dilute solution of sulphuric acid in heavy fulling stocks. This requires many hours and the material must be removed from the fulling machine from time to time, straightened out, beat into shape, and returned for further fulling. The fulled sheets are washed in water through squeeze rolls and dried on frames, afterwards pressed, and often sanded.

Reeling and Examining Worsted Yarn

We would like some information on reeling and examining worsted yarn. What is considered a fair production on 2/18s bulk skeins? On 4/8s, 1⅛ oz. skeins? The working schedule is 48 hrs. per week. How many reels per girl? How many reels should one examiner take care of? How many pounds per examiner per 48 hrs. of 2/18s? Of 4/8s, 1⅛ oz. skeins? Should an examiner be allowed a rest period? If so, how often and for how long? We would appreciate any other information you can give us on this subject. (6224)

A fair production of bulk skeins of 2/18s is 1500 lbs. per 48 hrs. The production should be about the same for 4/8s, 1⅛ oz. skeins. Though the count is much heavier the length is much shorter per skein, consequently there is more leasing, which results in a loss of production.

How many reels should an examiner take care of? This cannot be answered in number of reels, as no two firms run the reels at the same speed. The figures might be 3500 lbs. of 2/18s, or 7000 lbs. of 4/8. These figures are for picking out large slubs only.

Unless the examination is of a very thorough nature involving eye strain, no rest period is necessary.

Scroop on Cotton Flannel

We are bleaching cotton flannel and wish to give it a "crunchy" feel. We are using in the boil 3% caustic soda, 1% soda ash, and ½% silicate, boiling same for 10 hrs. We use acetic acid with the softener and bluing. Part of our goods have a crunchy feel and part do not. Will you kindly advise what gives the cloth this feel and how we can get all of the cloth the same way? (6233)

The crunchy or scroopy feel desired is caused by the precipitation of fatty acids on the fabric. As we understand the question, the inquirer is at present adding acetic acid directly to the softening solution. If this is the case, the reason that part of the goods have a crunchy feel and part do not is probably due to the fact that at times a decomposition of the finishing bath takes place, with the result that the fatty acids are liberated in the bath rather than on the cloth.

To obtain even and uniform results, it is necessary to use a two-bath method to produce this effect. While either the softener or the acid may be applied first, most finishers prefer the latter procedure.

No information was given as to what softener is used or as to the amounts of acid and softener. It is suggested, therefore, that the inquirer may first use separately the same amounts of acid and softener that he at present is applying in one bath. If that does not give a satisfactory finish, the following procedure is recommended: Saturate the cloth in a bath containing 1 gal. of acetic acid to 100 gals. of water, squeeze evenly, and pass through a finishing bath containing 3 lbs. of neutral olive oil soap to 100 gals.

If more scroop or crunch is desired, the amount of acid should be increased; if the goods are too harsh, more soap should be used.

Other organic acids, such as formic, tartaric, or lactic, may be substituted for acetic acid; of these lactic acid is usually considered to give the best results. Cocoanut oil softener, Turkey-red oil, sulphonated tallow, or other softeners may be employed in place of soap, but as a rule olive oil soap is preferred for giving this finish.

Streaks in Silk-Rayon Ribbon

I am enclosing herewith a clipping of piece-dye ribbon made with an 18/20 denier single white Japan warp and rayon filling of 85 denier. We are at a loss to account for the streaks of various intensity noticeable in this ribbon, as none of these defects appear or are noticeable before dyeing. What in your opinion causes this streaky effect and does the one very pronounced streak have the same cause as the lesser ones? I thank you for any explanation or help you can give which may assist me in overcoming this defect. (6236)

The streaks in the sample are caused by uneven tension on the warp threads during the warping. The heavy solid streak is from tight ends and the "sergy" streaks are from slack ends. Note the way the filling is drawn out of line where the heavy streak crosses. This is one of the things to guard against with raw silk warping. On the creel see that the spools are the same size and have an equal amount

of drag. In direct warping, the running of too large a number of ends on one roll will cause the outside ends to take up with different tension. On a horizontal warper badly placed sections and poor beaming or rolling will cause uneven tension.

Raw silk is coated with silk gum which makes the thread wiry and less pliable than dyed silk. This causes the goods to appear properly woven before dyeing. When the gum is boiled-out for dyeing, the filaments of each end open out and show the uneven tension. On the loom all raw silk warps should be much heavier weighted than dyed silk warps.

Tacking Hosiery

We would like to be advised of any information you may have in regard to tacking hosiery samples. We are particularly interested in the correct knot and the quality of thread or yarn which should be used for tacking. (6212)

We are sending a sample tacking, also a small piece of the blue tacking yarn. The knot is made by tying a single knot in the yarn to prevent it from being drawn through the stocking; sew through and draw the knot close to the fabric; pierce the knot and make another single knot by wrapping the needle once, draw tightly, and clip. The tacking is a rayon covered cotton, something like pearl crochet cotton No. 5. Color and quality should match the goods you manufacture.

Manufacture of Shoe Felt

I am enclosing a sample of slipper felt and would be pleased to have you give me some information in regard to its manufacture. According to my estimate, the sample does not seem to be made of woolen stock, but I would like to know if I could make something similar out of woolen or worsted stock? Where could I get machinery for making same? Kindly tell me where or in what region said material is being manufactured. (6243)

The sample of shoe felt submitted is from a piece of 22 or 24 oz. solid mix felt, a large percentage of which is wool. The manufacture of this material is rather complicated and requires quite an investment in special machinery. If the

inquirer now has a mill producing woolen cloth, some of the machinery could be used in felt production. The processes are as follows: Laying down the blend, mixing, carding, crossing, hardening, soaping, scouring, dyeing, extracting, drying, perching, shearing, pressing, measuring, folding, and rolling.

The blend is made up of various wools, wool shoddy, wool waste, flax, cotton, etc., proportioned so as to produce the desired quality at a predetermined cost. It is run through a mixing picker and a fearnaught to make it uniform, and blown to bins from which it is taken to breaker cards and formed into laps, or to breaker cards directly connected to crosser cards if the mill is so arranged. The crosser is an endless apron, 42 yds. long by 108 in. wide, running in conjunction with a 90-in. or 96-in. straight former card placed at one end and a crosser card of the same size set at right angles. Both cards run at the same time, their webs running direct from the comb to the apron; the web from the crosser card being led over a series of slat aprons and laid across the straight web by means of the camel back. When the desired weight of bat has been obtained it is trimmed, cut across and rolled up, and taken to the hardener.

The hardener consists of two heavy platens, usually 48 in. or 64 in. by 100 in. or 108 in., placed horizontally and made to vibrate—sometimes one platen and sometimes both platens—with a short stroke at about 600 times per minute. The bat is unwound on tables, treated with water and steam, and subjected to the action of the platens. This is the beginning of the fulling operation.

The pieces are then soaped and fulled in a pusher fulling mill until the required feel and measurements are obtained. They are next scoured to remove dirt and fulling soap and dyed in a reel dye tub. After being extracted they are dryed on a horizontal pin chain dryer, perched and inspected, sheared, and then pressed on a rotary hot press. They are then weighed, measured, folded, and rolled.

The production on felt similar to the sample submitted is about 16 pieces per day per crosser set; the finished pieces being 60-in. wide and 32 yds. long, and weighing about 48 lbs. We are sending a list of machinery manufacturers.

Inspecting Silk Goods

Kindly let us have your opinion as to the best method for skying raw silk pieces for imperfections, such as bar marks and uneven silk. At present we are skying pieces on measuring machines by a window. The pieces are between the window and the cloth inspector. Do you know of a better way of skying pieces, as we seem to be unable to see all the bar marks in the raw. (6239)

There is no better way of seeing imperfections than by the light of a window, or by a powerful electric light placed behind the goods. The inquirer complains that all imperfections are not noted by this method. It is true that everything cannot be seen, and a double inspection is the best method; that is, once against the light for such imperfections as will be shown by this method, and then the inspection table to catch such faults as do not show against the light. A capable inspector can so arrange his work that both of these operations can be done at one time.

Dyeing and Finishing Cotton-Rayon Linings

We are enclosing herewith some samples of mixed linings and would appreciate hearing from you as to what type of machinery you think we would require to dye and finish this material. (6246)

The general practice on this class of work is to use equipment peculiar to the requirements for regular silk piece-goods dyeing and finishing. We recommend first the so-called boiling-off machine for removing materials detrimental to the dyeing and finishing operation. There should be two sets of jigs, one set fitted with wooden tanks, lead-lined or monel-metal lined, having monel metal immersion rolls, or immersion rolls with monel-metal heads and journals and rubber-covered bodies (these jigs for stripping and bleaching), and additional jigs of the plain type with wooden tanks and brass immersion rolls, or monel metal immersion rolls, for dyeing dark shades and also washing and after-treating from the bleach.

We would recommend a drying machine of nine to eleven cylinders, horizontal construction, with copper cylinders tinned on the outer surface; dryer to be complete with rigging for receiving goods in batches and delivering in batches. For the lighter tints and the lighter-weight goods,

we would recommend so-called oval reel dyeing machines in six- or eight-foot lengths, depending upon the production of each shade required.

A hydro-extractor would be necessary for removing excess moisture after goods are dyed and before finishing. You would also need a quetsch for putting the necessary finishing ingredients into the goods after dyeing.

The tentering equipment should consist of a 50-ft. tenter with ground steel cylinder at delivery end, batching rigging, etc., gas heating coils and steam box for conditioning and drying the goods as they pass over the tenter. The final machine for finishing these goods would be a three-roll calender of special type for silk goods, with two felt paper rolls and one chilled iron roll. It may also be necessary for the finisher to use a button breaker or scroll breaker when handling a quantity of goods like sample.

Shark's Tooth and Tick Weaves

We have seen reference to the shark's tooth weave and the tick weave. The writer confesses ignorance of such weaves and will appreciate enlightenment through your Questions and Answers Department. (6245)

We have never heard of a weave termed shark's tooth. The tick weave may be a 2 up 1 down twill, or a 3 up 1 down twill, such as is used in making ticking. We have not heard these weaves called tick weaves, but persons dealing with ticking might naturally call them tick weaves.

A designer of wide experience states that he never has heard of such weaves as the shark's tooth or the tick weave.

The head of the designing department of a leading textile school replies as follows: The term "shark's tooth weave" and "tick weave" are unknown to us, and we have not been able to get any enlightenment from other sources. However, we talk about a "shark-skin effect" in a fabric. This effect is obtained on a 2 up and 2 down twill by using 1 black and 1 white thread alternately in the warp, and also in the filling. We presume the tick weave applies to ticking, but as there are a number of different weaves used in tickings, such as plain, satin, or twill weaves, we are at a loss to point out the specific weave the inquirer might refer to.

Selvages Roll on Three-Harness Weave

We are making for the first time a three-quarter width cotton-filled trousering on a three-harness, warp-face weave, and have been unable thus far to devise a wool selvage which will not roll and felt in the fulling mill unless tacked. This fabric, of which I enclose a small sample, contains 1560 ends of 2¾ run wool yarn in the warp, plus 30 ends of the same yarn each side for listing, and is reeded 3 per dent in a 14½ reed, making a loom width overall of 37.2 in. It is woven 34 picks of 1/18 cotton and is fulled to hold a 14% end shrinkage, 30 in. wide.

Besides the unbalanced three-harness weave, which is of course out of the question, we have tried various independent even weaves on the selvage, including cassimere twill, basket, cord, and plain. Having found that the degree to which the selvage rolls is governed somewhat by the amount of end shrinkage the cloth sustains, we have attempted to weave a selvage which is tighter on its outer edge than the body of the cloth, so that after the body of the cloth is completely shrunk, the selvage, which has undergone relatively less and shrinkage, will still be as tight as the body, thus obviating any tendency the cloth may have to pull the selvage in with it. In order to accomplish this we have tried with only fair success packing in the reed the first dozen ends on the outside of the selvage, which produces a thick, cord-like edge.

We should appreciate a discussion in your pages of this most interesting little problem, and shall await it before unconditionally surrendering our three-harness warp-face cloth to the tacking machine. (6242)

We suggest trying 25 ends on each side of fabric. Two-run wool yarn or a ply thread would be preferable, but of course the latter would be more expensive. If the two-run does not help, try one and three-quarter run, reducing the number of ends. With the present layout there seems to be no alternative to resorting to the tacking machine.

A designer replies to this question as follows: On all three-harness weaves we use either a plain weave or a basket weave selvage, but we have to dress the selvage much looser than the fabric, otherwise it will roll. They can either dress the selvage separately or put paper on the side and run this in from time to time with the selvage. On such a three-harness weave it is absolutely necessary to have the selvage looser on the beam than the body yarn.

If the selvage rolls a little after doing the above, I would reed it two ends in a dent, instead of three ends. The plain weave probably would be the better weave to use on this particular fabric.

Oxford Cloth with Unusual Count

There is enclosed a small sample of material that we understand was used in making pajamas several years ago. We desire to obtain some pajamas made from this material but do not know how to describe the material. Can you tell us the trade name of this material, and give the thread count? (6244)

Our analysis of the very small cutting shows a cloth count of 80 x 52, with 30s warp and 15s filling. This would be about 3.50 yds. per pound with the width at 35-in. It is a type of Oxford cloth, although we do not know of any trade name for it. It is a little out of the ordinary as to cloth count, almost approaching a medium-weight cheviot.

We are of the opinion that it is made from carded yarns; and would about cover the specifications for a coarse type of pajama cloth. It is a type of cloth probably used in tropical countries.

Yarn Drags in Unwinding from Cone

We are experiencing some difficulty here in the dragging of our bleached and natural yarn as it is drawn from the cone. We are looking for some means of eliminating this dragging or stickiness, and wish you would let me know by return mail what you would suggest. Our goods are mercerized in the skein, 58° Tw. caustic solution, rinsed and soured with sulphuric acid, rinsed in weak ammonia to eliminate last traces of acid, and run through a bath of sulphonated tallow, 5 lbs. of tallow to 100 gals. of water. (6253)

The writer has heard of this difficuty when sulphonated oils were used as softeners. Sulphonated products may be sticky enough on the yarn to offset any softening properties that they may have. If a softener is necessary it would be better to use one consisting largely of free oil, and containing little soap or sulphonated oil or fat.

Effect of Single Yarn Sizes on Luster of Mercerized Ply Yarns

What is the effect on luster of mercerized yarn with different sizes of singles used; for instance, if in making a 45/3 mercerized, one strand each of single 40s, 45s, and 50s are twisted together? Can you refer us to an article or a book covering this point? (6254)

Assuming that the twists were equivalent the difference in the result would probably not be very great, when using the three counts mentioned, as compared with the 45/3. Theoretically, the result would not be as good, because the fibers in the three yarns of different counts would not twist up as nearly parallel as they would if the three singles were all alike. The writer has never found anything printed on this subject, and doubts very much if there is anything.

Uneven Twist in Mercerized Yarn

We are enclosing herewith a skein of 36/2 mercerized yarn. You will note that the twist is very uneven, being alternately tight and loose. We ask if possible that you advise us the cause of this unevenness, and also if same can be remedied. (6267)

In examining this yarn we noticed that, in addition to varying in twist from tight to loose, there were places where one strand twisted around the other, giving a corkscrew effect, or entirely covering the other as is sometimes done in a core yarn.

The usual cause of this defect is uneven single yarn. The tightly twisted portions come where the yarns were light, and the soft twisted portions come where the yarns were heavy. It is a well established rule that the twist will tend to "run" into the thin places in a yarn and when this happens the fineness at that point is exaggerated by the extra twist that is present.

We marked this yarn at points where the twist was noticeably soft or hard and then untwisted the strand. Examination of the singles indicated that the trouble was due to unevenness in the single yarns. Although it is difficult to demonstrate, the twist in the single is probably uneven also, and the corkscrew defect probably results from a par-

ticular combination in plying of fine and coarse places in the single yarns with hard and soft twist. Where one yarn covers the other, it is probably an exaggerated example of this same condition.

We noticed that the sample skein was quite neppy, which may give some clue to the reason for the unevenness. We know of no way to remedy this defect because we feel it is due to unevenness of the single yarns. Once the yarn is spun, there is no remedying any unevenness that is present. In producing more yarn, however, by properly adjusting machines and preparing the roving, a uniform yarn should be obtained.

Killing Odor of Benzine Used in Cleaning

We have been told that there is a certain extract of which a small quantity can be used in benzine to offset the odor which is sometimes left with silk stockings when they are cleaned with benzine. We have been unable to determine just what this extract is, although our informant told us that he was of the opinion that it is oil of sassafras. We wonder if you have any information which will tell us what this might be, and whether it would be satisfactory for our use. (6252)

The following extracts will eliminate to a certain extent the objectionable odor resulting from the use of benzine: oil of citronella; oil of sassafras; and oil of mirbane. Naturally, the characteristic odors of the above extracts will be left in the goods, but they are pleasant rather than disagreeable. It has also been suggested that either oil of wintergreen or oil of cinnamon would be suitable for the purpose.

Tar Spots on Goods

We have been having trouble with tar spots dropping from the roof and getting on our goods. What chemical could we use to dissolve or wash out these tar spots, and would you suggest running them through the washer or boiling in the kier? We have tried the caustic boil without any result. (6240)

Tar spots are extremely difficult to remove from fabrics. If these spots only occur now and then and are not too numerous they probably could be best removed by hand

spotting; that is, treatment with suitable solvents such as carbon tetrachloride, benzol, etc. If the fabrics in question are quite badly spotted, which would make it impractical to resort to hand spotting, there is a possibility that the use of one of the new hydrogenated solvents, such as tetralin, employed along with caustic in the kier boil, might eliminate these stains. Tetralin is an excellent solvent for practically all kinds of fats, oils, greases, and similar materials, and is capable of being emulsified with water if first mixed with a small quantity of soluble oil and then added to the kier along with the caustic soda. It is non-inflammable and non-explosive, so that it can be safely used in kier boiling. We might add that a number of mills are employing tetralin in their kier boiling at the present time.

Wants to Desize and Kier Boil at Same Time

I am interested in the desizing of 44 x 40 gray muslin; that is, after the starch has been removed and the kier of cloth boiled, bleached, and soured, it will give a negative test to iodine solution. What I would like is some method that will desize and boil at the same time. It is a rather long process to desize in one operation and then kier boil. What would you suggest? (6255)

We believe there is no satisfactory method of desizing cotton fabrics and kier boiling at the same time. The desizing of the gray goods is really a slightly acid reaction and it is generally understood that a temperature of 140 to 145° F. is the most satisfactory at which to work the materials for desizing. It is therefore evident that both the alkalinity of the kier boil and the temperature at which the kier boiling is done would not permit of desizing in the kier unless some new intermediate for this purpose is developed which will work with alkalies at a high temperature.

Finishing Rayon-Filled Broadcloth

We are sending a sample of rayon-filled broadcloth, the finish of which we cannot duplicate. Our process includes two peroxide boils, and bleaching with sodium hypochlorite, souring, washing, etc. We have tried sulphonated oils, stearic acid, softeners, etc., but it seems that if we give a good broadcloth finish, the luster of the rayon is considerably deadened; leaving the goods plain finish does not give

a full hand or broadcloth appearance. Will you kindly suggest a detail procedure, formula and calendering, that will duplicate this piece. (6261)

In the first place we would suggest the use of pure sulphonated olive oil as the type of softener. Without knowing more about the types of calenders, etc., which the inquirer has in operation, it is a very difficult matter to cover the problem presented. The sample submitted has all the appearance of being calendered without very much pressure. This would check with the fact that some finishers who recently equipped for finishing silk and rayon have calenders built with special felt paper rolls for touching the face of the fabric where the rayon actually comes in contact with the rollers. It is quite probable that with a more complete description of the calenders available and samples of the results obtained by the inquirer, we may be able to assist further.

Luster on Lambskins

We would greatly appreciate it if you could tell us if there is any chemical that we can use to put a luster on lambskins which originally have very little luster after being dyed? We thank you in advance for any advice that you may be able to give us. (6247)

The question is not clear. If the inquirer refers to a dyed lambskin which has been through the usual processes of depilitation, pickling, pressing, etc., then the method of lustering employed is to swab the grain with various dressings. That is, the tanned dyed leather, after drying, is put through a staking machine to render it pliable and then is placed on a table and swabbed with such materials as shellac solutions, gum tragacanth, blood albumen, Irish moss, etc. After a short drying, the skins are put under a polishing machine or glasser which brings up the luster in a manner similar to that of polishing a shoe. Any standard leather book will describe such machines fully, or similar information is available from the manufacturers of leather finishing machinery.

If the inquiry refers to luster on lambskins with the wool left on them, the luster desired is on the wool. In this case a general brightening effect can best be secured by after-treatment with a good olive oil soap solution.

Depreciation of Machinery

With regard to depreciation of circular hosiery and underwear machinery, also worsted spinning machinery, can you advise us if there is any standard rate? Please give the method of depreciation, whether from original cost or from the balance showing each year. (6256)

There is no standard rate of depreciation in general use on circular hosiery and underwear machinery or worsted spinning machinery. A standard rate would imply that the age of the machine was the governing factor in determining depreciation rates, but this is not the case. The condition of each machine must be taken into account. Also, upkeep enters into this question very largely and has a direct influence on the depreciation rates used. Some plants might require an annual rate of 10% to properly reflect the actual depreciation which was being sustained each year, while others would not need more than 3% to reflect this physical deterioration.

When depreciation is based on original cost for accounting purposes, the deduction is usually made from the original cost itself and not from a diminishing balance. If depreciation is based on an appraisal as of a definite date, the depreciation is deducted from the replacement cost as of that date.

Tuck-Stitch Defect in Narrowing Full-Fashioned Hosiery

We are sending stocking for your examination and would ask you to inform us what you consider the origin of the threads which are evident between the fashionings and the outside of the stocking. We have marked them with a small circle. Just above these circles you will notice a small hole. This hole originally was exactly the same as the threads but under a slight strain the threads break into a hole of this character. We have made many investigations to ascertain the origin of this rather peculiar defect but are unable to find same after carefully examining all our throwing and hosiery finishing equipment. (6277)

This is a difficult problem. A full-fashioned hosiery expert has been working on it and has finally produced the same effect. The trouble is a tuck-stitch effect brought

about by the action of the narrowing points and needles at the time of both taking the stitches from the needles and transferring these stitches to needles further in. This actually stretches the fabric in the narrowed part, causing that part to sag by being longer than the other part of the leg and therefore not getting its share of weight pull. The effect is as follows:

All knitters know that a tuck stitch is caused by a needle (whether latch or spring beard) which for some reason has not drawn the new loop of yarn through the old loop and cast off the old loop. When the needle rises again with the old loop, the new loop which should have been a stitch and part of the fabric, now hangs loosely on the inside of the hose. This effect can be used with good results for lace, no-run lines, etc., providing every other needle, or others more apart, are used. But if the needles tuck side by side you will have a row of unpressed loops making a long single end, exactly as shown in the sample.

I would suggest that the needles be set to go further back into the knock-over-bit, carry as much weight as possible, and have the narrowing point and needle "bed" together closer during the narrowing operation.

Creases in Silk and Wool Poplin

We are weaving silk and wool poplin and find that when the cloth is creased in the raw it shows marks in these places after dyeing, as if the cloth was moired. We put a warp paper at the start of the piece on the bottom roll of the loom where the cloth rolls up, in order to keep the cloth straight. Is there a better method than this to keep cloth from creasing? Kindly let us know what you believe is the best way to handle poplins in the raw to avoid creases.

(6276)

Precaution should be taken to avoid creases and wrinkles in the raw. There is very little tendency for these to occur on the loom, as the cloth has substantial body and will roll up evenly and without creases. Precaution should be taken when the weaver takes the cut from the loom, and it should be rolled off carefully. During the inspection and picking process, it is necessary to watch that the goods are kept flat at all times, to avoid any creases or wrinkles. When the goods are shipped to the dyer they should be

rolled carefully, and shipped with a piece of paper around the piece to avoid chafing or wrinkles. Wrinkles are sometimes caused during shipping if the pieces are tied too tightly.

Two Shades in Dyed Ribbon

We are enclosing herewith swatch of ribbon. We are having trouble in dyeing, colors coming out in two shades. Kindly advise if there is any method by which this can be overcome. (6273)

The swatch of ribbon shows that two kinds of rayon have been used for filling, one taking the color deeper than the other. Another noticeable thing about the sample is that the silk warp is much lighter than the rayon filling. The dye for the silk was not mixed to give the same tint as the dye for the rayon filling.

Creased Selvage in Finishing Rayon-Striped Broadcloth Shirting

We are sending a piece of 134 x 66 rayon-striped broadcloth shirting. You will observe that the selvages are creased, due we believe to the gray mill failing to give that section of the cloth the same reinforcement as the main body of the piece. We tentered and chased this in our regular way, and the trouble first made its appearance on the tenter as it bagged its way into the clips. At the calender it was impossible to feed it into the nips without the selvage creasing. We would be pleased to receive any suggestion you have to remedy this condition, and to learn whether or not you think that this is a condition that should be rectified at the gray mill. (6321)

It is very evident that the finisher is up against what is commonly known to the trade as slack selvage. This is a fault which occurs frequently in fabrics designed with stripes and cord effects in the warp. The finished fabric shows an absolutely straight filling thread, finished to reasonably full width.

It is quite natural for the selvage, which is of fairly wide construction, to give more gain in length than the body of the fabric with the fancy woven cord and rayon stripe. We cannot see how the finisher can be held responsible for this trouble. The weaver should not crowd too many

warp threads in the selvage. It is a physical impossibility for the finisher to overcome the condition where the plain portion of the goods gains in length more than the fancy portion.

Singeing Goods Containing Rayon

In the October 29 issue of TEXTILE WORLD, page 159, there is an article which states that rayon-striped goods are run over a gas singer, but rayon-filled goods do not go through the singeing operation. We are about to singe a lot of rayon-filled goods and would appreciate a further explanation of this statement. We are holding up these goods for your advice. I hope you will clear this question up for us. (6283)

The author of the article in the October 29 issue of TEXTILE WORLD, which is referred to by the inquirer, replies to this question as follows: Rayon-striped goods have to be singed as the cotton predominates and not much rayon is exposed to the flame. Rayon burns very easily and although some plants singe rayon-filled goods, it is quite an expensive proposition if any quantity is burned. I would advise your inquirer to try a piece each way; that is, one piece singed and another not singed, and see if the extra operation is noticeable. There is another reason why singeing can be eliminated. The cotton warp yarn is usually of good quality and clean. I know of two plants which never singe the rayon-filled goods, and I understand that many other concerns follow this procedure.

Shiners in Rayon Fabric

We are mailing you a sample of artificial silk cloth, and in the filling you will notice a sort of moire effect. This can be seen only in certain lights. This defect comes from the filling and may be in one cop and not in another. In the piece it is found off and on throughout the entire length, some cops having it and others being without it. Any information you care to give us as to what causes this and how to eliminate it will be appreciated. (6275)

It is very evident that the defects shown in the goods are the result of improper treatment of the yarn, probably previous to the weaving. The filling has been stretched in places, which makes it reflect light differently at such

places as they lie in the cloth. Check up the tension in the winding or copping of the yarn; also check up the tension in the shuttle.

Heavier Yarns on Underwear Machines

We have some knitting machines, 11 cut with 36-gauge needles. We have been told that 11-cut machines are being used on heavyweight underwear, using about 11/1 carded yarn. We would be very glad to put our machines into use in place of some coarser machines which we are using, but have found that about 15/1 was the coarsest yarn we could use to advantage. We have thought that perhaps a larger hook on the needle would permit of the use of heavier yarn. Can you advise us in regard to this? We are enclosing two needles, one is a 36-gauge needle and the other a 24-gauge. Please advise us if a hook the size of the one on the 24-gauge needle made in 36 gauge would work satisfactorily in the 11-cut machine and use yarn as coarse as 11/1 carded. (6286)

It is true that a coarser yarn can be used on 11-cut knitting machines by changing the needles from 36 gauge straight to a 36-gauge needle with a 24 hook. The writer has seen it done in similar cases. If the cloth which the inquirer is now making does not feel heavy and boardy, it would seem that the change he wishes to make would be practical. Whether or not he could use an 11/1 yarn by changing the size of the hook is something that would have to be determined by experiment. The writer would suggest that the inquirer purchase enough needles for one machine and try it out, as it seems quite probable that results would be such as he desires.

Tight Marks on Silk Goods

Will you please advise me on the following: We have been troubled with slight tight marks which are caused by looms banging off, or when the weaver stops for filling. We have lay mark preventers on looms, with springs attached to take-up pawl, and I do not think the pick wheel slips. Would like to know how to overcome this; also what is the cause. (6322)

Check up on the sand roll, as no doubt the cloth slips when the loom is stopped.

Cleaning Separator Tins on Worsted Frames

To clean our separator tins on cap spinning frames we are using rags dipped in kerosene. Many of the doffers who do this work are complaining that they feel sick from the smell of kerosene and the skin of their hands suffers. If you know of any better and more pleasant way for the doffers to clean the tins, I would appreciate your advice very much. (6305)

The method used by the inquirer is the common way of cleaning separator tins. We referred the question to a worsted spinner of wide experience, and he replies as follows:

Probably the doffers do not like the extra work of cleaning the separator tins and make up excuses in order to get out of it. I never knew of the oil affecting anyone. Workers may cut their hands on old tins, but these should be taken off and replaced with new ones. It is my practice to have the spinners clean the tins every time the frame is doffed, then the tins do not get dirty. Just have the spinner take her cleaning rag and wipe off the tins. This keeps them clean all the time and helps the spin. This relieves the doffers of the extra work, the machines look better, and the spin is better. I know that some mills let the cleaning go until the tins are caked with dirt which sets very hard. This will never occur where the spinners wipe the tins every time the frame is doffed.

Mixing Warp Size—Temperature of Size

Will your Question and Answer Department please furnish me with answers to the following questions which have reference to the ordinary thick-boiling corn starch. The size is intended to be used on 9s and 13s indigo-dyed, cotton warp yarn: (1) Should the starch be brought to the boiling point slowly or quickly? (2) If slowly, in what time? (3) If quickly, in what time? (4) After getting it to the boiling point, how long should it be held there before it would be ready for use? (5) What is the best temperature to keep the finished size in the storage tank? (6) What is the best temperature to have the size in the slasher size box on the above yarns? (6312)

When starch is brought in contact with water, the granules, owing to the large absorption of water, swell up enormously and at some temperature, which varies accord-

ing to the variety of starch, ultimately rupture the outer layer, the whole mass forming a semi-transparent paste.

The ordinary pearl corn starch gelatinizes at a temperature of 160 to 167° F. The writer has, in his experience, found that the best results have been obtained by putting in the kettle about two-thirds of the water, then adding dexrine slowly, then adding the starch and the tallow in the order given. The mixture is constantly agitated while adding the ingredients. The balance of the water to complete the mixture should then be put in.

The steam is then turned on and the mixture brought to the boil in 45 min. This allows ample time for the granules to soften, absorb the water, swell up, and burst. After the mixture comes to a boil it is held for 45 min., which is sufficient.

In regard to the temperature in the size box, 190° F. has been found by the writer to be most suitable for this kind of work. The temperature in the storage tank should be governed by the temperature used in the size box. If there is a very wide margin between the temperature of the storage tank and that of the size box, the temperature of the size must necessarily change when colder size is added to the box. To avoid this change there should be very little difference between the temperature in the storage tank and that in the size box. The storage tank should be kept within 5 or 6 deg. of the temperature adopted for the size box.

Reclaiming Heat from Atmosphere of Boiler Room

Is there a practical method to reclaim heat from the atmosphere of a boiler house? We have a building 40 x 60 x 22 ft. Top of boilers to ceiling is 8 ft. The temperature 3 ft. from the ceiling is 150° F. We have two horizontal tubular boilers 72 in. x 16 ft. Can you suggest a method to economically wash, filter, or clean heated air so as to use it for heating or drying purposes? (6307)

The only practical way of reclaiming this heat is to jacket the boiler flue with an air duct which is open to the outdoor atmosphere, so that clean air can be taken in. A fan should be used to draw the air through the duct and deliver it to the dryer or wherever wanted. Such an arrangement will reduce the temperature of the boiler room materially

and save waste heat, but precautions should be taken not to cool the flue too much and thereby affect the draft.

Expert engineering advice is necessary to determine the amount of heat that can be taken away and provide an efficient installation. In one mill that we know of an engineer has installed an arrangement whereby two dryers are provided with heat from the flue.

Thread Finishing

Can you advise us what you would recommend for use in the finishing bath given to cotton yarn for sewing thread purposes? We do not seem to be able to get the best results by an ordinary sulphonated castor oil finish. Most of our competitors' products seem to have a sizing of some kind which at the same time lends a scroopy feel to their yarn.

We are enclosing a reeling taken from one of our competitor's brands. This particular thread has not been blued, but just bleached in the ordinary way. It is made from a 60/3-ply, right-twist Sak Egyptian cotton yarn. It feels to the writer as if some paraffine has been used in winding, but aside from this, the reeling itself does not feel starchy, yet the individual thread seems highly scrooped.

We have heard of several people using tartaric acid as a last finishing bath in order to give yarn scroopiness. Will tartaric acid hurt cotton when used as a last bath and the material then put into a dry room at about 160° F. temperature?

We would appreciate it if you could recommend to us a finish that will give a little body to yarn, yet at the same time not be sticky or starchy so that the winding will be affected or that the threads will stick together. We also would like your opinion as to whether you think an acid finish is desirable for sewing threads, or whether you think an oil finish is more desirable. (6265)

The sample of thread is what is known as flat lock finish. A formula to produce this finish is as follows:

50 gals. water.
12 lbs. starch.
8 lbs. white tallow softener.
6 lbs. white wax.
3 lbs. cocoanut oil, commercial.
2 lbs. sal soda.
Boil up the mixture in a barrel.

Dissolve the starch in cold water to make a paste. Add the softener to boiling water first; then add the cocoanut oil and sal soda; then add the starch solution. Then boil and as soon as the mixture comes to the boil shut off the steam. The size is used at a temperature of 120° F.

The writer would not use or advise using tartaric acid on such fine counts. If you soap the yarn first and then run it into the size bath without washing, you can add a little more soap to the regular soap bath and this will give all the scroop you want.

Action of Water on Needles

We would like to ask if in your experience you have ever found that soft water, which had been softened by a chemical softener apparatus, has any bad effect upon the needles of the full-fashioned knitting machine. We have been led to believe that there might be some corrosive action caused by soft water on these needles. (6257)

It is impossible to say anything specific in regard to this particular case of possible corrosion of full-fashioned knitting machine needles by soft water, because nothing is said as to the true condition of the water nor the types of chemicals used.

It is sometimes stated that neutral softened water, owing to its greater solvent action and lack of crust-forming ingredients, is more powerful in its action upon metal containers (such as hot water systems) than normal raw water. It seems probable in the case of knitting machine needles that trouble might come from improperly controlled chemical softening, with the result that the "soft" water really contains a surplus of acid or alkaline chemical.

Acidity might come from a surplus of alum in alum-treated water, for alum by hydrolysis gives an acid reaction. Such acidity might cause a corrosive action by solution of metal or by electrolysis. Alkalinity from surplus alkali in the softening process might aid rusting and therefore wear.

Chemically softened water needs careful vigilance to furnish water of uniform quality and satisfactory reaction (or neutrality), otherwise it may vary from one lot of water to another.

Twist in Worsted Yarns

Will you give us a list of twists for single and two-ply worsted yarns in mixtures used for men's wear, in 40s, 46s, 50s, 60s, and 70s. Kindly note that we feel it would be better to use one kind of twist for the warp and a softer twist for the filling. Do you think this is practical in mixtures? In making a 12-oz. serge with 2/40s white, both warp and filling, would you have the twist the same or not? (6260)

The following twists are used in a prominent men's wear mill:

No.	*Single*	*Two-Ply*
40s	14½	14
46s	16	15½
50s	17½	17
60s	18	18
70s	20	19½

Using two kinds of twist for warp and filling would not be very practical. The only advantage a softer twist would give you would be a quicker shrinkage in width and possibly a little softer handle. These would be offset by the careful handling required for two different twists of the same color even if the count should be different. The counts could not be so greatly different anyhow if you make men's wear. You might have considerable trouble with mixed yarn, like streaks in warp or bars and uneven shrinkage in filling.

Another point to be considered in the matter of two different twists in men's wear mixtures is that it would take a lot more yarn to run the mill if there were different twists for warp and filling. In running mixtures one cannot order such big batches, and if it is necessary to split them up for different twists it would cost more to make yarn. If big batches are ordered there is the danger of making more yarn than one needs, which might result in being left with odd yarns on hand after the season was over.

In making serges with 2/40s white, we would have the twist in both warp and filling the same. In men's wear the twists for warp and filling are generally the same if one is using two-ply both ways. Different twists are more

commonly found in women's wear to bring out or subdue the twill, make shadow stripes, etc.

A worsted superintendent replies to this question as follows: You could put less twist in the single with high quality stock. The speeds of the machinery enter into this question also. As a rule, the mill makes the twist to suit the fabric they want to produce. However, the following twists are very nearly what the different mills use:

No.	*Single*	*Double*
2/40s	14	12
	15	13
2/46s	15	14
	16	15
2/50s	15	13
	16	14 or 15
2/60s	15	15
	16	16
	17	17
2/70s	15	15
	16	16
	17	17
	18	18

Different mills have different ideas which they have worked out to suit their purposes.

Sinker Marks in Hosiery—Cleaning Cylinders

We at times have trouble with sinker marks in five-thread silk on 260, 280, and 300-needle machines. We find it very difficult to correct by taking out a few sinkers at a time. Do you think it would be advisable to change, at regular intervals, all the sinkers and if so, how often should they be changed? Our machines are run night and day. Will you also advise what, in your opinion, is the best way to clean fine gauge cylinders, and if you consider air pressure practical for this purpose. (6281)

We think it would be advisable to change all the sinkers at once, at a time when the first ones start to show trouble. In this way we believe most needle streaks can be eliminated. The apparent extra cost of sinkers should be offset partly, if not wholly, by fewer seconds. When running a regular schedule, changing at regular intervals should be

an advantage. We hesitate to set a frequency for changing, particularly as so many factors—as speed of machine, care, yarn, and working conditions—all contribute in limiting the life of a sinker.

If you mean cleaning the cylinders in the machine, we think that using air is the only likely way. If you mean cleaning cylinders removed from the machine, we feel that a small brush with wire bristles will get the dirt out more completely than the air. In using compressed air, watch for water or moisture carried in the air, as there is a chance of starting rust on the cylinders with any moisture.

Machine Twist Rough in Spots

We are enclosing a sample of machine twist, size B, and wish you would look this over and advise us, if possible, the reason for its being rough in spots. This is made of Japan silk, extra grade, and really tests for breaking strength higher than standard. We have an idea that it might be caused by not being degummed thoroughly enough, but our dyer assures us that it is degummed for four hours, which seems to us sufficient even for this hard twist. Any information which you might be able to give us will be greatly appreciated. (6302)

This sample of machine twist, size B, is a smartly twisted, relatively coarse yarn, made of three major groups of threads, which in turn are composed of three other groups, each of these being made of three or four individual threads. On a careful inspection of the yarn, places will be noticed here and there where there is a very slight protruding hairiness of a distinctly small or local character, and not extending further than the spot where it is localized.

A careful investigation of the cause of the defect shows that the boiling-off, or the dyeing, has nothing to do with the matter at all, beyond discharging the gum, but that it is a defect latent in the raw silk thread itself. The writer carefully untwisted all the strands at some places where the hairiness occurred, and found that out of the whole mass of individual threads, only one thread at each place presented this loose or hairy condition. By careful examination under the microscope, it was seen that this hairiness was not due to any cut or abraded fibers in the threads, but that in the group of individual raw silk filaments which composed the

thread, one of them showed substantial loopiness, due to a greater length of filament than its adjoining partners in the thread.

This defect originates in the original reeling of the silk. The cocoons to be reeled are subjected to the action of boiling water, and brushing with a rough, revolving brush, so that the broken, loose, and tangled filaments on the outside of the cocoons will be removed and caught in the brush. In this way the main thread of each cocoon is secured, beginning with which the cocoon can be unwound. The cocoons, after boiling and brushing, are then removed to the reeler's basin, in which the water should be maintained at a temperature as hot as can be borne by the hand, say about 140° F. The reeler then forms a group of cocoons of the number that is to be reeled, bringing the ends of them together and passing them through the necessary guides, makes the crossing for the binding together and consolidating of the individual filaments into one homogeneous thread. The reeler carries this over the guides and back to the reel. One reeler will reel four to eight skeins at a time in this way. As the reeling proceeds, the filaments fly off each cocoon in each group, and, collectively, are wound up into the thread known as raw silk.

If it happens that the boiling has not been sufficiently done to thoroughly soften the natural gum of the silk of the cocoons so that they will unwind with absolute freedom, or, as is more likely to be the case, if the water in the reeling basin is allowed to become too cool so that the gummy threads will not run off as freely as they should, it will occasionally happen with a cocoon here and there that instead of its filament coming off in a steady and continuous manner, it will come off in loops at times. After passing through the crossing, these projecting loops will become plastered down on to the collective thread, and will usually not be visible to the eye on the inspection of the raw silk. When, however, in boiling off the gum is removed from the manufactured yarn, these loops will appear on the surface of the thread, whether it be in the form of sewing thread or woven cloth. Of course in some places the loops may be held in by the other fibers around them, and may not show as a blemish; in other cases, owing to the frictional stresses incurred in the various operations of manufacture, these

loops may become broken and may then appear as broken filaments instead of as loops.

If the inquirer will take pains to untwist some threads where this hairiness occurs, and, after locating the particular individual thread in which the trouble occurs, will secure that thread, at stretch, on a microscope slide, placing a cover glass over the spot where the defect is, and then examine it under a sufficiently powerful microscope, he will have no trouble in confirming the explanation made above.

JAMES CHITTICK

Broken Rayon in Stocking

We are enclosing a stocking consisting of 150-denier artificial silk and one end of real silk. You will notice that in a number of places the rayon has entirely disapppeared and we are at a loss to understand the cause of this. (6294)

The stocking was closely examined and it was found that the rayon was considerably tendered in spots. There are several possible causes for this trouble. One possibility is that the rayon was weak in spots when received and the subsequent treatments naturally would weaken it still more. We would suggest that you examine the dye and degumming machines very carefully to ascertain whether any jets of live steam are striking the goods. The knitting machines should be gone over carefully and all rough needles and guides eliminated.

Holes in Rayon Webbing

We are enclosing you a piece of rayon webbing which is full of holes. Will you kindly advise us what, in your opinion, causes these holes; whether it is the yarn, the knitting, or the bleaching and dyeing? This cloth was given a peroxide bleach preparatory to dyeing. (6241)

It is difficult to state the exact cause of these holes with only the sample of cloth to examine. It is only possible to list what might cause them. In the first place, it is always advisable to get in touch with the firm from whom you are buying your yarn, and let them know in detail what the nature of your trouble is. The fault may be with weak yarn in places which do not appear until the knitted

cloth is being processed. If you have hard water this may help to cause your trouble. Yarn which has stood for some time with oil in it is not in the best condition for obtaining perfect cloth. Too strong an alkaline bath with too high a temperature may have a tendency to weaken thin parts of rayon yarn. If your cloth is not absolutely free from chemicals, before drying, holes will appear. Check up your drying, if you dry by a mechanical process, and note if any cuts could come from this step in your processing. Any tension on your cloth while wet might cause a slight breaking of the small filaments which would allow a hole to appear later on.

Softening Silk Yarn

We would be pleased if you would advise us what method of treatment has been used in softening the thread silk in the sample cones that are being forwarded to you. The throwster who has supplied us with the samples mentions that it is a special process evolved by him, and that it takes approximately three or four weeks for him to treat the yarn so that it will gain its softened effect. We have tried it out in knitting and it certainly seems preferable to the ordinary process. (6279)

The cones submitted were carefully examined and, as the inquirer states, they are conditioned very well indeed. But the writer cannot see why it should take three or four weeks to obtain this effect when the usual overnight treatment should give results fully as good.

In the throwing of silk as much attention should be given to the selection of the soap and oil used in the soaking or conditioning of the fiber as is given to the mechanical end. Pure and perfectly neutral olive oil soap and pure olive oil, or products that will give as good results, should be used. Equal parts of these products are boiled up with enough water to make a thin creamy emulsion (1 lb. each to 5 gals. of water). Boil for 30 mins. To 100 lbs. of silk use 1½ lbs. each of olive oil and olive oil soap, and soak overnight at a temperature of 100° F. In the morning drain, hydro-extract, and dry. Do not wind until the silk has had a chance to regain its moisture.

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